

THE IRON AGE

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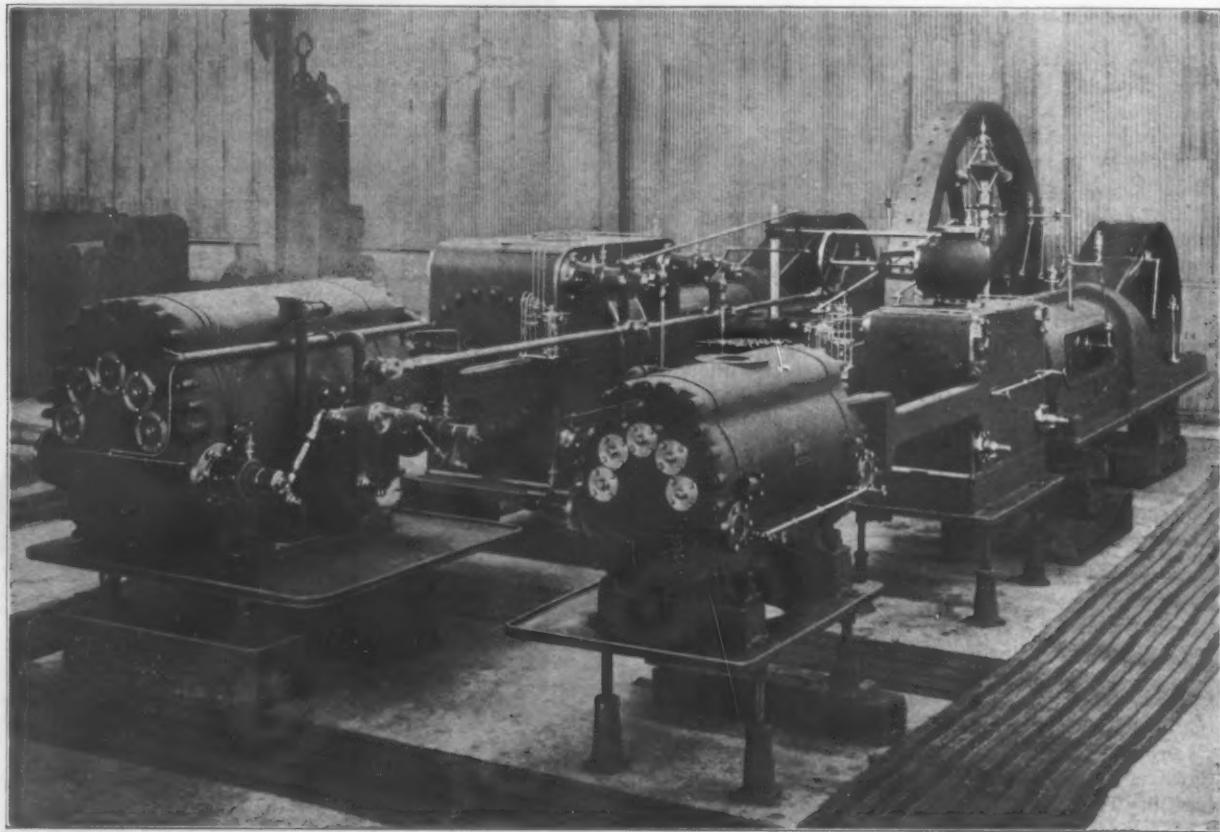
New York, Thursday, July 15, 1909.

Mesta Air Compressors.

The range of heavy duty machinery built by the Mesta Machine Company, Pittsburgh, Pa., has been extended to include air compressors. Two large ones were recently completed for the Pittsburgh-Buffalo Company to be installed in its mines at Marianna, Pa., which are to be the largest and best-equipped coal mines in the world. The illustration shows one of these compressors as it appeared on the erecting floor, prior to shipment, from which it will be seen to follow the lines of the Mesta heavy duty rolling mill engines. It is a cross compound two-stage compressor, having a capacity of 3600 cu. ft. of free air per minute delivered at 100 lb. pressure when

appearance of the machine in the power house. It is also preferable to have the intercooler below the floor on account of the condensation on its surface which is continually dripping on the machine if the intercooler is placed overhead. A special feature of this intercooler is the means provided for passing the cooling water in a comparatively thin film along the walls of the pipes, which is expected to reduce the quantity of cooling water used to about one-half to one-third of the amount necessary in an intercooler with plain pipes.

A pressure regulator is attached to the main engine governor and operates a floating lever. The air pressure acts on a plunger which is held down by a weight and spring. The plunger is a ground fit in a cylinder, and no packing of any kind is being used. The pressure reg-



The First Large Air Compressor Built by the Mesta Machine Company, Pittsburgh, Pa.

running at 75 rev. per min., and its total shipping weight is 200,000 lb.

The compressor is of the rotative crank and fly wheel type with air cylinders connected in tandem to the rear end of the steam cylinders. The steam end is of Corliss type with a high-pressure cylinder 22 in. diameter, a low-pressure cylinder 36 in. diameter and a stroke of 48 in. The low-pressure air cylinder is 34 in. diameter and the high-pressure 20 in. diameter. The compressor valve gear consists of semi-rotary inlet valves positively driven from an eccentric on the main shaft and automatic poppet outlet valves; the latter are of a new improved design and are practically noiseless in operation. All valves are located in the cylinder heads which reduces the clearance to a minimum.

The cylinder and cylinder heads are effectively water-jacketed. A large intercooler is also provided between the first and second stages on the compressor, which, being located below the floor line, also makes it possible to keep all piping, except the discharge from the high-pressure cylinder, below the floor line, and improves the

ulator in connection with the engine governor will vary the speed of the machine to suit the demand for air and is calculated to keep the air pressure within 1 per cent. of normal.

The Mesta Machine Company has entered this field, believing there will be a demand for such heavy duty machines and it is the intention to build only larger sizes and for very heavy duty. The company has also built for the Marianna mines of the Pittsburgh-Buffalo Company a 26x48 in. heavy duty simple Corliss engine directly connected to a 500-kw. generator. This engine has been in operation now about eight months and it was its satisfactory performance under the very variable conditions of load existing that prompted the Pittsburgh-Buffalo Company to contract with the same builder for the above mentioned compressor, and also for a large first motion hoisting engine although neither of these machines has been built before by the Mesta Company. The hoisting engine is a 36x60 in. twin machine with conical drums and is expected to be put in operation by November 1.

Brown & Sharpe Miller Tests.

At the recent Master Mechanics' and Master Builders' convention in Atlantic City the Brown & Sharpe Mfg. Company, Providence, R. I., exhibited two milling machines and a full line of milling machine attachments. The results obtained on the machines in tests which were made are recorded in the following:

On the No. 5-B plain milling machine, from a piece of steel of 65,000 lb. tensile strength, 18 cu. in. per minute were removed at a feed of 16 in. per minute and surface speed of 60 ft. per minute. The cut taken was 6 in. wide and 3-1/8 in. deep. It is reported that at no time during the running under such severe strains did the machine show signs of distress or appear to labor excessively, and the noticeable absence of vibration from all parts was one of the impressive features of the demonstration. A nickel was placed on edge at one end of the table and a full glass of water at the other end. Cuts were taken with so little vibration that the nickel did not fall nor any of the water spill from the tumbler. A gang of two cutters of 3-1/4 in. in diameter was used in this test. On the No. 3 vertical spindle milling machine 9.375 cu. in. per minute were removed at a table speed of 12-1/2 in. per minute and a surface speed of 60 ft. per minute. A cut 6 in. wide and 1/8 in. deep was taken at each traverse of the table. The cutter used was a 9-1/2-in. inserted tooth face mill. The same tests were applied to this machine as the No. 5 machine. Both machines were motor driven by General Electric direct current motors. That for the No. 5 machine was of 20 hp., and the one for the No. 3 machine of 10 hp. capacity. The amount of stock removed per horsepower consumed was 0.85 cu. in. on the No. 5 and 0.88 cu. in. on the No. 3.

The performance of one gang of cutters used on the No. 5-B heavy plain milling machine was rather remarkable. The cutters cut 1800 cu. in. of steel without having to be removed from the arbor for sharpening. The great rigidity of the machines and the effectiveness of their weight in absorbing vibration, their high efficiency and their excellent condition at the end of these severe tests are important as reflecting the excellence of design and construction of the machines.

An American Exposition at Berlin.

An American Exposition will be held in the city of Berlin, Germany, during the months of April, May and June, 1910, in the Exposition Palace near the Zoological Garden, located in the best and most frequented part of the city.

Prominent citizens and business men on both sides of the Atlantic will co-operate to make this exposition successful. The European management will be in the hands of men previously experienced with expositions.

Max Vieweger, Hudson Terminal Buildings, 50 Church street, New York, is American manager for the exposition, and is distributing literature giving the details of the enterprise, with information regarding the applications for space, rates charged, etc. An appeal to American industries, urging representation at this exposition, has been made by a considerable number of prominent citizens. Among them are the names of heads of representative manufacturing establishments. The statement is made that the exposition will be unique in that the price of space per square foot will include those incidental expenditures which are ordinarily most annoying to exhibitors.

The exposition is intended to educate Europeans, especially the people of Germany, on the importance and excellence of American manufactured products, and thus strengthen the existing cordial relations and stimulate trade between the two countries.

The English company, J. G. White & Co., Ltd., at its annual meeting, declared dividends of 8 per cent. on the preferred and common shares for the fiscal year ending February 28, 1909. The company's reserve fund stands at £100,000, and the profits carried forward amount to £15,400.

The Brown Electric Recording Pyrometer.

A new instrument, Fig. 1, for use in conjunction with a thermo-couple as a thermo-electric recording pyrometer has recently been designed and patented by Edward Brown & Son, 311 Walnut street, Philadelphia, Pa. This type of recording gauge can also be used for accurately recording pressure of steam and air, or an electric volt or milli-voltmeter, &c.

As a pyrometer the complete equipment consists of a thermo-couple, as illustrated in Fig. 5, consisting of two nickel alloy rods suitably insulated and protected, the recording electric pyrometer and the leads or wire for connecting the thermo-couple and the recorder. The length of the leads are commonly anything from 100 to 500 ft., and very frequently the same thermo-couple which generates the current for the recorder also actu-

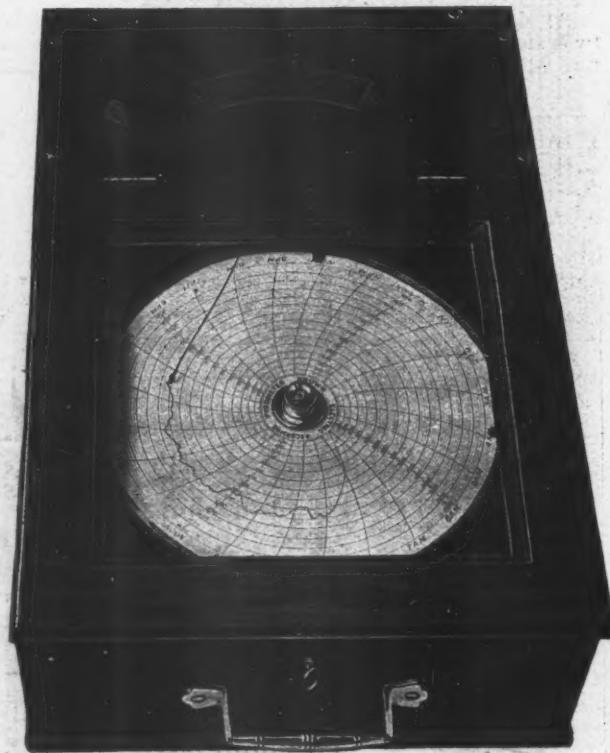


Fig. 1.—The Electric Recording Pyrometer, Made by Edward Brown & Son, Philadelphia, Pa.

ates an indicating instrument on the same circuit, but located near the furnace for the operator's guidance.

The electric recording pyrometer gauge consists of a milli-voltmeter system carrying a small drop of ink on the pointer or needle. As this milli-voltmeter system is in a horizontal position, there is no change in weight or position of the pointer with an increase or decrease of ink. An 8-in. chart of stiff white paper is raised once a minute by a powerful eight-day clock movement and touches the ink pen, making a small dot on the chart. These continuous dots form into a fine line, and as the pen is only in contact with the chart an instant the pointer is able to fluctuate readily with the rise and fall in temperature. This momentary contact with the paper is necessary in an electric pyrometer, as the current which is produced by the thermo-couple and which actuates the needle is so small that the friction of the needle on the paper, if it was in constant contact, would retard the needle and render the reading inaccurate or hold it from movement altogether.

In order that the chart may be readily removed from the instrument without the danger of striking the pointer or necessitating the moving of the system, the chart and clock mechanism are carried on a drawer which can be withdrawn, as illustrated in Fig. 2. This drawer is carried on ways or guides, causing the drawer to be lowered as it is drawn out and preventing the pointer dragging a line across the chart. The drawer can either be

withdrawn part way, as shown in Fig. 2, or can be withdrawn entirely, as shown in Fig. 3, and the chart removed and a fresh one placed in position. It is much simpler to change the charts on a recording pyrometer when lying on a table or shelf than when in the recording case.

Once a day, when changing charts, a drop of ink is placed in the recording pen with a dropper or pointed article. Occasionally also it is desirable to pass a camel's hair brush dampened with water through the recording pen to clean it and insure a fine ink line. To enable this to be easily attended to a frame is raised from the base of the recording instrument as the drawer is withdrawn and forms a rest for the pen pointer, as may be seen in

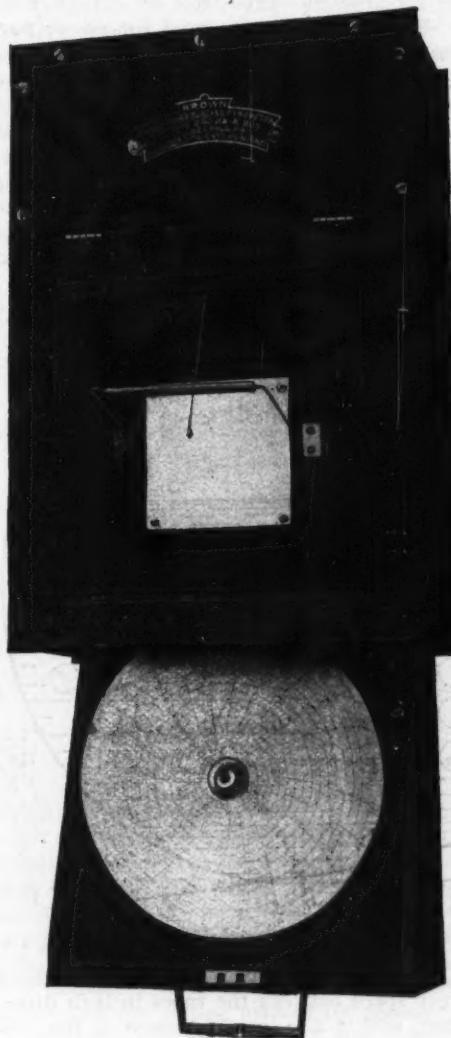


Fig. 2.



Fig. 5.

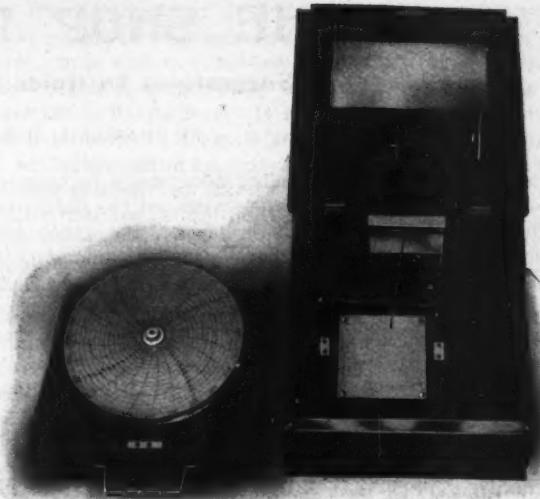


Fig. 3.

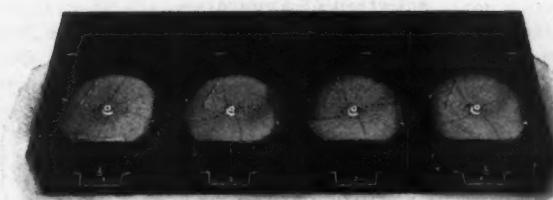


Fig. 4.

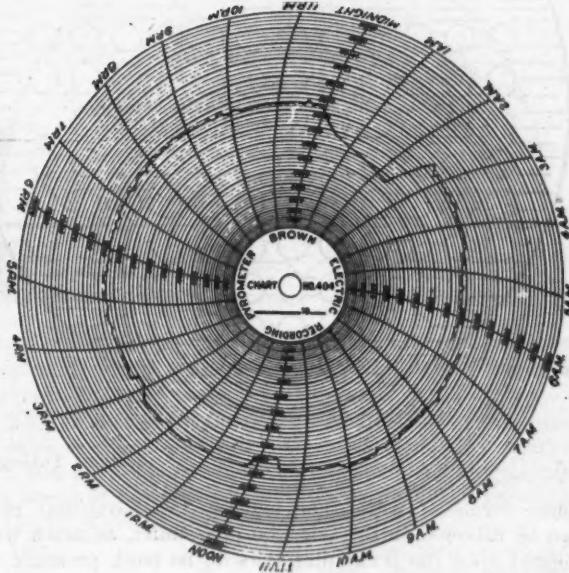


Fig. 6.

The Brown Electric Recording Pyrometer.

Fig. 2. Although the parts of the recording instrument are well protected by the case, the milli-voltmeter and the clock mechanism are both enclosed in metal cases as an additional protection from dust.

Where it is desirable to record the temperature of several furnaces these recorders can be supplied to record 1, 2 or 4 furnaces, all records being made in one case. Fig. 4 illustrates a quadruple electric recording pyrometer for recording the temperature of four furnaces, which makes a desirable equipment for many large works. The recording electric pyrometer can be supplied for any desired range in temperature, and the record charts can be made to revolve once in 24 hours or 7 days, if preferred.

In Fig. 6 a reduced facsimile of a record chart is shown. This chart shows the form of dotted red line made by the Brown recorder and incidentally shows that the fireman attending this furnace neglected his work for about $2\frac{1}{4}$ hours during the night, as shown by the drop in temperature.

These pyrometers have already been supplied for use

at a number of blast furnaces and for annealing ovens, glass melting furnaces, brick kilns, and other operations where a clear record of the temperature is desirable.

Excess Speed Alarm for Motor Vehicles.—The London *Times Engineering Supplement* describes an automatic mechanism which is being brought out by an English manufacturer in order to meet the forthcoming regulation to be issued by the metropolitan police, to the effect that mechanically propelled vehicles will be required to be provided with a device to give audible indication whenever the legal limit of speed is exceeded. The apparatus consists of a gong mounted on the car and arranged so as to be struck by a rotating lever which flies outward into contact with projections on the gong when the speed of the vehicle is excessive, the lever being actuated from the shaft or other moving part of the engine. The mechanism can be adjusted to suit any speed of engine, size of wheel or speed limit, and when once adjusted it can be sealed by the authorities.

THE SHOP POWER PLANT.

Suggestions to Guide the Selection of Equipment.

BY CHARLES L. HUBBARD, AUBURNDALE, MASS.

In the average shop probably most study to improve economy is given to the cost of turning out the particular product manufactured. This is proper, but other less important items should not be overlooked, among them the power plant. The following aims to give briefly matters to be observed in the selection of new apparatus; methods of obtaining the size of boilers, engines, and auxiliaries for different requirements, and ways of increasing the present power of a plant while keeping within the bounds of reasonable economy. No attempt will be made to go into the different matters with the accuracy and detail necessary in the case of large electric plants. The subject will be treated rather from the standpoint of the shop owner or superintendent than from that of the mechanical or steam engineer.

Selection of Apparatus.

Boilers.—The choice of a boiler will usually lie between the ordinary horizontal fire-tube and one of the

throughout the country use the horizontal fire-tube boilers. They cost less, have a greater water capacity, which gives a less rapid fluctuation of the water-line and thus require less careful attention, and when properly designed and cared for and inspected at regular intervals are comparatively safe against explosion.

In selecting a tubular boiler the manufacturers' tables of dimensions for different capacities should be used with caution. Boilers of this type used for power purposes are usually rated on a basis of one horsepower for each 12 sq. ft. of heating surface. This makes it a temptation on the part of the manufacturer to crowd as many tubes as possible into a shell of a given size to give it the maximum rating at the least cost. To get the best results there should be a good space above the tubes for the separation of the steam from the water to secure dryness, and there should also be ample room for the circulation of water between the shell and tubes and

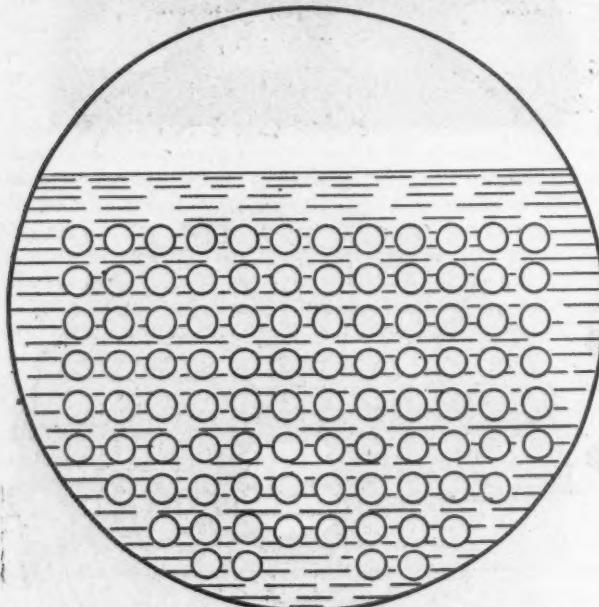


FIG. 1.

Sections Through Two 100-Hp. Boilers.

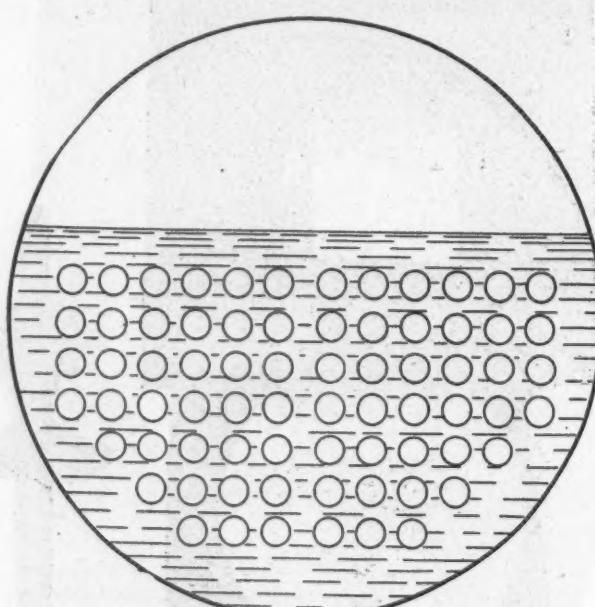


FIG. 2.

many forms of water-tube boilers. No particular rule can be followed in the selection of a boiler, as much will depend upon the maximum price to be paid, pressure to be carried, available space, &c. Generally speaking, when boilers of any of the well-known types are equally well designed and proportioned for the work to be done, and are operated with the same skill, and provided with the same quality of fuel, one type will give about the same economy as another. This leaves the owner free to choose a boiler best suited to his own taste and to any local requirements which may exist.

If the plant is of considerable size, carrying a high pressure, and the boilers are located in or near a building containing a large number of operatives, the matter of safety should be given especial weight. Here the water-tube boiler has the advantage, as the water is divided into small masses, which tends to prevent serious results in the case of rupture. Among other features of the water-tube boiler may be mentioned a large amount of fire surface, causing a more rapid circulation of the water, with a decrease in the liability of both overheating and the accumulation of sediment and scale; or large draft area through the tubes, resulting in a slower movement of the gases and a greater absorption of heat; the losses from the accumulation of soot and ashes is less than in the case of fire-tube boilers, as they do not adhere so readily to the outside of the tubes as to the inside. All of these features tend to economy.

Probably the greater majority of the machine shops

also between the tubes themselves. In general, there should be a clear space between the tubes in both directions of one inch, with a 2-in. vertical space at the center, and at least 3 in. between the tubes and the shell at the sides.

Figs. 1 and 2 are each sections through a 100-hp. boiler. They are of the same diameter (60 in.), but the first contains 94 3-in. tubes 12 ft long, while the second has 72 tubes of the same size 15 ft. long. The proportions of the second boiler are better because there is a larger steam space and more room for the circulation of water between the tubes, and the greater length of the tubes will give better economy in the use of fuel, as more opportunity is allowed for the absorption of heat. The defects in the first boiler would become more pronounced should it be forced above its nominal rating.

The number and size of tubes for boilers of different diameters as recommended by the Hartford Steam Boiler Inspection and Insurance Company are given below and will be found useful in checking up catalogue ratings:

Diameter of shell. Inches.	Diameter of tubes. Inches.	Number of tubes.
36	2½	34
42	3	34
48	3	44
54	3	54
60	3	72
66	3½	48
72	3½	90
	3	64
72	3½	114
	3	98

The type of bracing is important. Through bracing is of advantage from the standpoint of strength, but is objectionable in all but the largest sizes, as it makes the boilers more difficult to enter for inspection. A good plan is to compromise by using diagonal bracing in the smaller sizes, say from 36 in. to 48 in., a combination of diagonal and through bracing for 54 in. and 60 in. boilers, and all through bracing for 66 in. and 72 in. boilers. Figs. 3 and 4 show the usual arrangement of combination diagonal and through bracing. The pressed steel diagonal braces now in use are preferable to the older form of crow-foot braces with fork and pin, as they are free from welded points and therefore more reliable.

The longitudinal seams should be of the butt-joint type, with either double or triple riveting, according to the pressure carried. Lap joints will give sufficient strength when new, but are apt to become weakened by constant expansion and contraction. The thickness of shell will depend upon the diameter of the boiler and the pressure carried. For a working pressure of 100 lb. per square inch, with a factor of safety of 6, and double riveted butt-joints, shell plates of best quality mild steel $\frac{3}{8}$ in. thick may be used up to and including 54 in. diameter; 7-16-in. plates may be used for 60 and 66 in. boilers, and $\frac{1}{2}$ in. for 72 in. If higher pressures are to be carried, the plates should be thickened accordingly.

Engines.—The conditions of shop and factory work are usually less exacting upon the engine than those in electric power plants. As a general thing, the load is more uniform, and during the heating season, at least,

medium speed engine or the Corliss type may be used. The first of these has a steam consumption of 28 to 32 lb., is compact, costs somewhat less than the Corliss, has fewer parts and is therefore cheaper to keep in repair. The Corliss is of necessity a slow-speed engine on account of its valve gear. It requires a long but narrow floor space, its economy is good, running from 26 to 30 lb. of steam per i.h.p. Both of these types are well adapted to shop and factory work of the best class, and require fair operating ability.

When the load is fairly constant and economy in steam consumption is important the compound engine may be considered. The first cost is considerably more than for the simple engine, being perhaps 30 per cent. greater under average conditions. On the other hand an economy in steam consumption of 25 to 35 per cent. is not uncommon, while the increase in fuel consumption necessary to raise the boiler pressure from 80 to 125 lb. will not exceed 1 per cent. The greater economy of compound over simple engines is due in part to the reduced cylinder condensation, but more especially to the higher initial steam pressure and greater number of expansions. In simple engines the initial pressure is generally limited to 80 or 90 lb., and the number of expansions to about 4. Any increase beyond these limits is usually accompanied by excessive cylinder condensation, which more than offsets any gain from the greater expansion. In compound engines the initial pressure may be carried up to 120 or 140 lb., which allows of 8 to 10 expansions without excessive condensation. The objection commonly

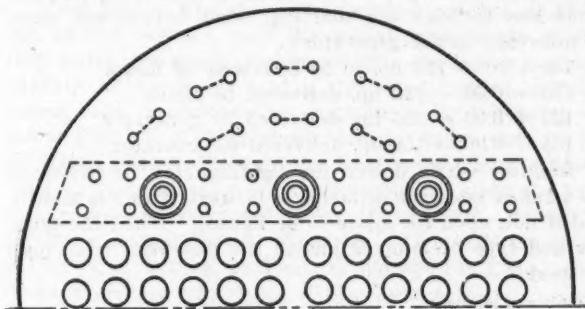


Fig. 3.

The Usual Arrangement of Combination Diagonal and Through Bracing.

the matter of steam economy is not of so great importance. Under these conditions the selection of an engine depends to a considerable extent upon personal preference, first cost, and the skill required to operate it. In certain up-to-date plants the owners may take an especial pride in the engine room and the results obtained in the way of steam economy, even if this saving is offset to a considerable extent by the increased cost of the engine and the skilled attendants necessary to care for it. Certain locations may be favored with cheap fuel and have long heating seasons, in which case steam economy is not of so much importance, and a simple low-priced engine requiring a minimum of attention will be the most satisfactory, while in other cases the conditions may be reversed.

Although the regular day requirements of a shop engine may be practically uniform, the matter of lighting must be considered, and this during the short days of the winter months is an item of considerable importance. The question here may be to decide whether it is best to install a separate outfit for lighting or to overload the regular engine for the lighting period, even at a loss in economy. Under these various conditions it seems best to simply give some of the principal characteristics of the different types of engines, from which the shop owner can select the one which seems to be best suited to his own requirements.

The simple throttling slide-valve engine is the cheapest and requires least skill in operating. It is adapted to small plants, and where fuel is cheap or where the exhaust steam can be used to advantage the greater part of the time. The steam consumption in a well designed engine of this type will run from 32 to 40 lb. per i.h.p. per hour. For greater economy either the four-valve

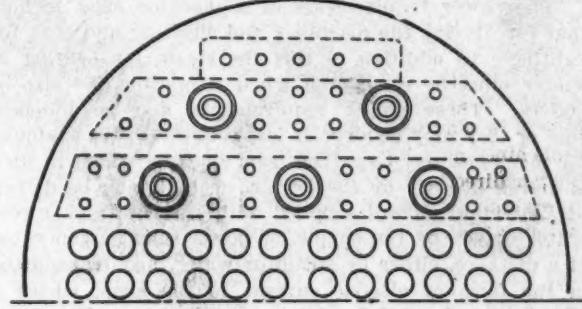


Fig. 4.

raised to compound engines is the falling off in economy when underloaded, which is somewhat greater than in a simple engine.

The economical range of a compound engine lies between one-half and full load. The following results of a test on a 150-hp. tandem compound engine running at a speed of 250 rev. per min. under an initial pressure of 125 lb. is taken from *Steam*, July, 1907:

$\frac{1}{4}$ load	50 to 55 lb. steam per horsepower-hour.
$\frac{1}{2}$ load	35 lb. steam per horsepower-hour.
$\frac{3}{4}$ load	28 lb. steam per horsepower-hour.
Full load	25.5 lb. steam per horsepower-hour
$1\frac{1}{4}$ loads	24.8 lb. per horsepower-hour.

A table of comparative data taken from *The Engineer*, July 2, 1906, gives the following, which is based on the steam consumption per kilowatt at the switchboard:

	Compound.	Simple.
	Single-valve.	Four-valve.
$\frac{1}{2}$ load	55 lb. per kw.	47 lb. per kw.
$\frac{3}{4}$ load	38 lb. per kw.	42 lb. per kw.
Full load	36 $\frac{1}{2}$ lb. per kw.	40 $\frac{1}{2}$ lb. per kw.
$1\frac{1}{4}$ loads	37 lb. per kw.	41 lb. per kw.

As already stated, the load is fairly constant in shop work, except during the lighting hours, and both of the above tests show that a compound engine may be operated at $1\frac{1}{4}$ load without appreciable loss, and in fact the first test shows a slight gain. It so happens that the lighting and heating seasons come at the same time, so that any increase in the exhaust will be utilized in the heating system.

Compound medium speed engines have an average steam consumption of 23 to 27 lb. per i.h.p., and compound Corliss from 22 to 26 lb. The water rate given in each case is for non-condensing engines. For condensing engines the following give average results:

	Pounds.
Simple, medium speed.....	21 to 25
Compound, medium speed.....	17 to 21
Compound, Corliss.....	16 to 20

Compound engines are commonly built either tandem or cross-compound, the latter consisting of two complete machines attached to a common shaft and fly-wheel. The tandem is more compact, taking up but little more room than a simple engine; it has fewer parts and therefore requires less attention, both of which adapt it more especially to shop and factory work in the average sized plant.

Pumps.—Both steam and power pumps are used for boiler feeding. While the former are wasteful of steam, they have the advantage of being operated automatically or of being throttled down to a point where the speed is just sufficient for the needs at any time, while power pumps belted to the engine necessarily run at a constant speed and any regulation must be done by by-pass valves.

Steam pumps are of two general types, piston and plunger. The first is commonly used where the water is pure and free from grit, otherwise it is difficult to keep the piston tight and detect leaks when they occur. On this account the plunger pump is often preferred. Its plunger is easily reached and any wear is cared for by renewing the bushing in which the plunger slides. A plunger pump which may be packed from the outside is especially recommended for boiler feeding where the pressure is over 125 lb. per square inch.

Size of Engines and Boilers.

The power requirements of a machine shop include that for driving the machines and shafting and that for lighting. In addition to this the steam for heating in winter must be considered when computing the size of boilers. These power requirements may be independent or they may be more or less connected; for example, the machines may be driven from shafting which in turn is driven directly by the engine, or they may be driven by individual motors supplied with current from a generator driven by the engine, or power may be generated at a distance, either by steam or water, and transmitted in the form of electric current to the shop, where a single motor is used for driving the shafting. The lighting may be done from the general supply or from an independent outfit, and the heating may be either by exhaust or live steam or by both. Owing to the various combinations which may exist in a single plant each power requirement will be traced back separately from motor to generator, engine and boiler. In this way any combination may be made up as desired.

Where the combination of engine and shafting is used the first step is to determine the power necessary to drive all of the machines. Lists are available giving the approximate horsepower necessary for different machine tools, from which the total can be determined with sufficient accuracy. To this about 10 per cent. should be added for shafting, &c. This total represents the horsepower to be delivered by the engine, and to find the indicated horsepower we must divide by 0.8 for well made engines under 100 hp. and by 0.9 for larger sizes. (These efficiencies will vary with different types and makes of engines, but the above are sufficiently accurate for approximate results.) Having determined the indicated horsepower of the engine, it should be multiplied by the probable water rate for the type used to determine the weight of steam required per hour. This divided by 30 will give the boiler horsepower required.

Example.—The combined machinery of a shop requires 100 hp. What will be the indicated horsepower of a simple noncondensing engine using 35 lb. of steam per indicated horsepower per hour? Also the boiler horsepower?

$$100 + 10 = 110 \text{ hp. for machinery and shafting.}$$

$$110 \div 0.9 = 122 = \text{indicated horsepower of engine.}$$

$$122 \times 35 = 4270 \text{ lb. of steam per hour.}$$

$$4270 \div 30 = 142 \text{ boiler horsepower.}$$

Where the machinery is driven by individual motors an average efficiency of 0.85 may be assumed for these motors, large and small; an efficiency of 0.90 for the dynamo and 0.90 for the engine. Taking the same example as before we have:

$100 \div 0.85 = 118 \text{ hp. of electrical energy to be supplied to the motors.}$

$118 \div 0.90 = 131 \text{ hp. to be delivered by the engine for running the dynamo.}$

$$131 \div 0.90 = 145, \text{ the indicated horsepower of engine.}$$

$$(145 \times 35) \div 30 = 169 \text{ boiler horsepower.}$$

The economy of using individual motors is that when a machine is shut down no power is required, while the usual arrangement of line shafting and loose pulleys must run constantly, regardless of the number of machines in use at one time. If all of the machines were in constant operation the above example shows the shaft driven equipment to be the more economical. If the machines were used for heavy work, so that motors of large size were required, it is likely that a higher efficiency could be counted upon; and again the arrangement of the shafting might be such that 10 per cent. would be too low for the power consumed in running it. In comparing the two methods of driving it is necessary to consider the cost of keeping the shafting, pulleys and belts in repair in comparison with the motors, as well as the actual power required. Again the item of danger from belts and pulleys and the improved appearance of the shop should be given due weight.

When power is brought from a distance over transmission lines, and line shafting is used driven by a motor, losses in the generator, in transmission, in the motor and in the shafting must be considered. Taking the same example and assuming efficiencies of 0.90 for the generator, 10 per cent. loss in transmission, and the same loss through the shafting, what horsepower must be delivered to the generator?

$$100 + 10 = 110 \text{ hp. to be delivered by motor.}$$

$$110 \div 0.90 = 122 \text{ hp. delivered to motor.}$$

$$122 \div 0.90 = 135 \text{ hp. delivered by generator.}$$

$$135 \div 0.90 = 150 \text{ hp. delivered to generator.}$$

Lighting.—The power for lighting may be based on the number and type of lamps to be used, if this is known, and if not, upon the space to be lighted. When the number and type of lamp is known the following table may be used:

Number of lamps supplied by 1 hp. of electrical energy at lamp terminals.	Type and power of lamp.
12.....	16 cp. incandescent.
6.....	32 cp. incandescent.
2.2.....	Half arc, open.
1.5.....	Full arc, open.
1 to 1.5.....	Closed arc.

The efficiency of a first class generating set (engine and dynamo), including the losses in transmission may be taken as about 75 per cent., when located in or near the building to be lighted, so that the electric horsepower necessary to supply the lamps, divided by 0.75 will give the indicated horsepower of the engine. From this the boiler power can be determined, as already described.

Example.—What engine and boiler horsepower will be required to care for a lighting plant having 600 incandescent lamps of 16 c.p. each, and 300 of 32 c.p. and 20 closed arcs of the larger size? The engine is to be high speed, compound, noncondensing, using 28 lb. of steam per indicated horsepower. From the above we have:

$$\begin{array}{r} 600 + 12 = 50 \\ 300 + 6 = 50 \\ 20 + 1 = 20 \\ \hline 120 \end{array}$$

This is the horsepower of electrical energy required of the dynamo, hence $120 \div 0.75 = 160 =$ indicated horsepower of engine, and $(160 \times 28) \div 30 = 149 =$ boiler horsepower.

When the number of lamps is not given the lighting may be based on the floor space. For incandescent lighting in offices and drafting rooms we may allow 1.8 watts per square foot of floor space for brilliant illumination, and 1 watt for general or medium lighting. For arc lighting the following may be used:

Office	1.8 watts per square foot floor space.
Drafting room.....	2.1 watts per square foot floor space.
Machine shop.....	0.74 watts per square foot floor space.
Erecting room.....	0.58 watts per square foot floor space.

Having determined the total number of watts re-

quired for lighting the kilowatt rating of the generator can be found by dividing by 1000. The electrical energy in horsepower may be found by dividing the total number of watts by 746 and the indicated horsepower of the engine by dividing the electrical horsepower by 0.75 (the efficiency of the generating set).

Example.—Electric lighting is to be provided for a manufacturing plant in which the floor space is divided as follows:

Office	800 sq. ft.
Drafting room	1,000 sq. ft.
Machine shop	15,000 sq. ft.
Erecting room	10,000 sq. ft.

The offices and drafting room are to be brilliantly lighted with incandescent lamps, and the shop and erecting room with arc lights. What will be the required size of generator, indicated horsepower of engine and boiler horsepower?

	Watts.
Office	$800 \times 1.8 = 1,440$
Drafting room	$1,000 \times 1.8 = 1,800$
Machine shop	$15,000 \times 0.74 = 11,100$
Erecting room	$10,000 \times 0.53 = 5,300$
Total.	19,640

Calling this 20,000 in round numbers we have:

$$\begin{aligned} 20,000 \div 1,000 &= 20 \text{ kw. generator.} \\ 20,000 \div 746 &= 27 \text{ e.h.p.} \\ 27 \div 0.75 &= 36 \text{ i.h.p. of engine.} \end{aligned}$$

Assuming a high speed simple engine requiring 35 lb. of steam per indicated horsepower the boiler horsepower will be $(36 \times 35) \div 30 = 42$.

Feed Water Heaters.—The required amount of heating surface depends upon the initial temperature of the feed water, the steam pressure within the heater and the velocity of the water within the tubes. With exhaust steam from noncondensing engines, it is customary to allow 1 sq. ft. of heating surface for about each 90 lb. of water passed through the heater per hour. When exhaust steam from condensing engines is used the surface should be increased about 50 per cent., owing to the lower temperature of the steam. This calls for about 1.3 sq. ft. of heating surface per horsepower for noncondensing engines and $\frac{1}{2}$ sq. ft. for condensing.

Condenser.—The size of the condenser, like the feed water heater, depends entirely upon local conditions, and in selecting it is usual to furnish the manufacturers with the necessary data and let them select the proper size. In determining the size it is necessary to know the weight of steam to be condensed per hour, the pressure in the condenser and the initial and final temperature of the cooling water. Assuming average conditions of 3 lb. absolute pressure in the condenser, and initial and final temperatures of 70 and 110 degrees, respectively, for the cooling water, it gives the following results, which may be useful in approximating the required size in any particular case:

Steam per i.b.p. of engine—pounds per hour.	Square feet of cooling surface in condenser per i.h.p. of engine.
25	27
30	32
35	38

Pumps.—The capacity of a given size of pump depends upon the speed at which it is run and the amount of slip or leakage past the piston and valves. A pump should be of such size that when running at its full capacity the piston speed will not exceed about 75 ft. per min. The following table of boiler feed pumps is based on a slip of 80 per cent. and gives the capacity, both in pounds per hour and boiler horsepower which it will supply:

Size of pump.	per hour.	30 strokes per minute.		45 strokes per minute.		60 strokes per minute.	
		Pounds	Hp.	Pounds	Hp.	Pounds	Hp.
2 x 1 $\frac{1}{2}$ x 2 $\frac{1}{2}$...	198	7	297	10	396	13	
3 x 1 $\frac{1}{2}$ x 3...	720	24	1,080	36	1,440	48	
4 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x 4...	2,316	77	3,474	116	4,632	154	
5 $\frac{1}{2}$ x 3 $\frac{1}{2}$ x 5...	4,800	160	7,200	240	9,600	320	
6 x 4 x 6...	7,530	250	11,295	376	15,060	502	
7 $\frac{1}{2}$ x 4 $\frac{1}{2}$ x 6...	9,600	320	14,400	480	19,200	640	

The proportions given in the table are for moderate to high steam pressures. If it is desired in any special case to operate the pump at a pressure much less than 20 lb., it should be provided with larger steam cylinders.

In designing a boiler plant it is best to use two pumps, each of such capacity that one of them running at a speed of 50 or 60 strokes per min. will deliver the maximum quantity of water required under ordinary conditions. This makes easy work for the two running together and allows a reserve pump in case of a breakdown.

Increasing the Power of a Plant.

The logical way of increasing the power of a steam plant is to install additional or larger apparatus when the best economy of operation is considered. There are cases, however, where it may be desired to increase the power temporarily or for only a few hours a day; or perhaps the shop has outgrown the power plant and it is intended in a year or two to erect a new one. In the meantime it is desirable to increase the power of the present plant without installing new boilers or engines. The following gives some of the different ways of increasing the output of boiler and engines already in use. Some of these methods call for a corresponding loss in economy and should only be considered as temporary makeshifts, while others are along the line of permanent improvement:

Boilers.—Among the ways of increasing the power of a boiler plant may be mentioned first of all, greater skill in firing and cleaner heating surfaces, both outside and inside; next the installation of a feed-water heater for utilizing the exhaust steam, if one is not already in use; economizers for saving a portion of the heat ordinarily passing up the chimney; the placing of pipes or tubes along the sides of the furnace, thus adding to the heating surface of the boiler, and increasing the amount of evaporation by the use of forced draft. The increase in power by the first of these methods will depend entirely upon present conditions and the improvement possible in firing and cleaning. Without going into probable results, it is safe to say that this is always the first point to be considered when more steam is called for, as it is in the line of both increase and economy of output.

Computations show that about one-seventh of the steam evaporated by the boilers may be utilized in heating the feed-water from 70 to 200 deg. This means that the boilers are relieved of this amount of work and therefore have just so much more capacity for making steam. If the exhaust can all be used in the heating system there is no gain to be made during the winter months by this method, but the advantage during the time when heating is not required is sufficient to warrant the use of a heater in nearly every case.

The effect of an economizer through which the hot gases pass on their way to the chimney is the same as adding to the heating surface of the boilers, although the additional surface cannot be rated on the same basis per square foot, owing to the reduced temperature of the gases to which it is exposed. The percentage of gain in power will depend on circumstances, but under average conditions will amount to about 12 per cent. In using an economizer for this purpose it is customary to provide from 4 $\frac{1}{2}$ to 5 sq. ft. of heating surface for each boiler horsepower. When economizers are used simply to save fuel without increasing the power of the boilers it is not necessary to increase the strength of the draft, because less fuel is burned and hence less draft is required. But when it is desired to burn the same or even a greater amount of fuel, as when an increase in power is desired, it is usually necessary to increase the strength of the draft to overcome the effect of the added obstruction to the flow of the gases and their lower temperature by using a fan.

Means for increasing the capacity of a boiler by additional heating surface placed around the furnace are usually patented devices and are more or less effective according to their design.

With mechanical draft the capacity of a boiler may be increased from 30 to 40 per cent. Forcing a boiler beyond a certain limit lowers its efficiency, but for short periods and for temporary requirements in special cases it is often more than offset by the reduced first cost and the smaller operating expenses. The loss in economy due to forcing is partially offset in two ways; first a cheaper grade of fuel may be used than with a natural draft, and again a certain gain in efficiency is obtained,

due principally to the deeper fires which may be carried with forced draft and to the more intimate contact of the air with the coal. The increased pressure forces the air into space between the fuel which could not be reached under a lesser draft, and as a greater proportion of the air is therefore involved in combustion the total quantity is reduced, resulting in a hotter fire and a greater radiation of heat to the boiler surfaces.

Engines.—The power of an engine can be increased by raising the boiler pressure; by delaying the cut-off; by running at a higher rate of speed, and by using a condenser.

Before raising the boiler pressure to increase the power of an engine a careful inspection should be made of the boilers to see if they are able to safely carry the added pressure. Again, engine parts are designed for certain maximum loads, and it is always well to ascertain from the makers the limit of pressure which can be safely imposed upon them. Raising the initial pressure above the normal for which an engine is designed produces a waste of steam, because it increases the cylinder condensation somewhat, due to the higher temperature, and the terminal pressure is higher and more heat is lost in the exhaust. Here again the utilization of the exhaust steam for heating purposes is an important factor to be considered.

The following table gives the theoretical mean effective and terminal pressures for an engine cutting off at one-fourth stroke, but with different initial pressures, and will be found useful for purposes of comparison, although actual results would vary somewhat on account of cylinder condensation, the effect of clearance, compression, &c.:

Initial pressure (gauge).	Mean effective pressure.	Terminal pressure (gauge).
80	42	9
90	48	11.5
100	54	15

As the power of an engine at constant speed varies as the mean effective pressure, it is evident that raising the initial pressure from 80 to 90 lb., with the same cut-off, will increase the power in the ratio of $\frac{48}{42} = 1.14$. Or raising the initial pressure from 80 to 100 lb. will increase the power in the ratio of $\frac{54}{42} = 1.29$. The terminal pressure in the first case is 9 lb. and in the last it is 15 lb. per square inch. The difference in the total amount of heat contained in a pound of steam at these two pressures is about 4 B.t.u., which means that this additional amount of heat is wasted in each pound of steam discharged from the engine when exhausting outboard.

The effect of delaying the cut-off with the same initial pressure is practically the same so far as waste of heat in the exhaust is concerned. Here there is no change in the temperature of the steam, so the cylinder condensation is not increased; in fact, it is slightly reduced owing to the smaller range through which the steam expands. Following is given a table similar to that above, except in this case a constant initial pressure of 80 lb. is maintained and the cut-off is increased from one-quarter to one-half:

Cut-off.	Mean effective pressure.	Terminal pressure (gauge).
$\frac{1}{4}$	42	9
$\frac{1}{2}$	48	13
$\frac{3}{4}$	65	33

Increasing the speed of an engine at constant pressure and cut-off does not materially change the steam consumption per horsepower. The difficulty here is that the strength of the various moving parts are proportioned to the speed at which the engine is designed to run. Any decided increase in speed adds to the centrifugal force exerted in revolving parts and to the inertia of reciprocating parts, and tends to throw the whole machine out of balance. Here again the matter should be referred to the builders of the engine and a limiting speed should be fixed by them.

The effect of attaching a condenser to an engine under average conditions is approximately the same as adding 12 lb. to the mean effective pressure. Hence the increase in power will bear the same ratio to the present power as 12 does to the present mean effective pressure.

Here the question of utilization of the exhaust comes into prominence again, and the cost of condensing water must be considered. Sometimes the problem is solved by attaching a vacuum system to the heating coils, thus reducing the back pressure by several pounds during the heating season and using a condenser during the summer months.

The methods given show the general effect rather than actual results. These can only be determined accurately by means of tests in each particular case.

B. F. Avery & Sons.

Peabody, Houghteling & Co., Chicago, are offering at par and interest the unsold portion of an issue of \$500,000 first mortgage serial gold bonds of B. F. Avery & Sons, Louisville, Ky., manufacturers of agricultural implements. The purpose of issuing these bonds is explained as follows in a letter from George C. Avery, the president:

The company manufactures plows, planters, cultivators and other agricultural implements. The business was founded by Benjamin F. Avery at Clarksville, Va., in 1825. In 1847 Mr. Avery moved to Louisville, where he opened a plow factory. In 1877 the business was incorporated under the laws of Kentucky, with a charter expiring in 1953. Since its inception the business has been continuously under the personal management of B. F. Avery or one of his sons.

The Avery products have always been popular in the Southern and Southwestern States, where the concern has a leading position in the trade. About 50 per cent. of its products is distributed in the Southern States east of the Mississippi River, about 25 per cent. in the Southern States west of the Mississippi River, and about 25 per cent. in the Ohio Valley States and in foreign countries.

The company employs an average of about 800 men. Its factory is run practically all the time at full capacity, and during the recent panic its operations were not reduced more than about 25 per cent.

The company's financial condition is excellent. While it has paid 6 per cent. dividends on both preferred and common stocks for many years, it has steadily built up a working capital in excess of \$1,800,000, and a substantial surplus. The company owns about 4 acres of land in the heart of Louisville and has leased all available surrounding property (some 4 acres) to increase its plant. A congested city district now hedges in its works on all sides and there is imperative need of a new plant with enlarged facilities.

Last year the company purchased and paid for 31½ acres of ground on the southern limits of Louisville, immediately adjoining the Southern Railway and within easy switching distance of the Illinois Central and Louisville & Nashville railroads. This tract of ground cost the company in cash \$50,046, and the company proposes immediately to erect, at an estimated cost of \$536,000, a thoroughly up to date plant, into which it will move all of the available machinery and equipment of its present factory. The purpose in issuing these bonds is to provide funds for the completion of this new plant, without impairing working capital. Careful estimates show that the saving to the company in rentals, operating expenses and increased facilities resulting from this new plant will amount to not less than \$50,000 per year.

The auditors report that the profits of the business before charging interest were \$191,936 in 1904, \$370,253 in 1905, \$318,732 in 1906, \$224,856 in 1907, and \$128,573 in 1908. There are outstanding \$600,000 of preferred stock and \$464,000 of common stock.

The Central Tube Company.—This company, with offices in the Lewis Building, Pittsburgh, and works at Economy, Pa., and incorporated some time ago with a capital stock of \$350,000, expects to place its new mill for the manufacture of wrought pipe, nipples, &c., in operation early in September. Walter F. Ingals has been appointed manager of sales. He has had a wide experience in the sale of pipe and tubes, having been connected with the National Tube Company for 11 years, withdrawing July 1 to assume his new position. The Central Company will be represented by Olin, Giberson & Hilands, 2 Rector street, New York, in the New England States, New York, eastern Pennsylvania, Virginia, Maryland, New Jersey, Delaware and District of Columbia. This firm has had a long experience in the tubular business, and is well equipped to look after the trade in the sections named.

The Utah Engineering & Machinery Company has been organized at Salt Lake City, with offices in the Newhouse Building, to prepare plans and furnish machinery for industrial plants, including mills, smelters, &c.

The Peerless V Belt.

Differing in design, construction and application from the usual all-steel types of link belts, the belt here illustrated is composed of a side bar steel link chain encased between an under strip of rawhide and friction paper top blocks. This belt, which is V-shaped, is the product of the Peerless V-Belt Company, Chicago, and the claims for it are unusual efficiency in the transmission of power, great durability and noiseless operation.

Fig. 1 shows a piece of the belt with the casing cut away on one end to expose the chain. The continuous strip of specially prepared rawhide, forming the bottom and sides of the belt, and the friction paper top blocks are held together by through rivets passing between the center blocks of the chain links and are far enough apart to allow free action of the chain around a pulley. Each of the top blocks is reinforced above and below by a steel plate or washer which is attached to the block by prongs. The rivets and rivet holes have flat sides to secure the block against lateral displacement. The chain side links are wedge-shaped, and the sides of the top blocks are beveled to correspond, and the assembled belt conforms

made in two sizes, measuring $\frac{5}{8}$ in. and $1\frac{1}{4}$ in., respectively, across the top. Where greater power is desired it can be run in multiples. The $\frac{5}{8}$ -in. belt is designed to transmit one horsepower for every 200 ft. of lineal contact per minute, while the $1\frac{1}{4}$ -in. size requires about 130 ft. of lineal contact per minute per horsepower. These efficiencies are based upon adequate distances between centers, which, however, need be but little longer than those used for chains. Special V-shaped rims made for attachment to any flat faced pulley can be supplied, so that to install the belt a new equipment of V-shaped pulleys is not necessary.

The No. O Simple Electric Hand Drill.

Simplicity of construction is the main feature of the No. O Simple electric hand drill made by the Willey Machine Company, Jeffersonville, Ind. The electrical connections are attached to the main casing of the machine, and are not disturbed when the drill is taken apart for inspection, which only requires the removal of two nuts. The drill spindle has two long bearings, with removable bushings of high grade phosphor bronze and a ball thrust bearing at the handle end takes the end thrust when drilling. For the convenient stopping and starting of the drill a snap switch is placed on the side of the frame. The motor is well ventilated, insuring cool running and high efficiency. No gears are used in the drill,

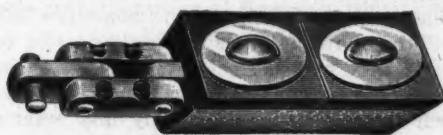


Fig. 1.

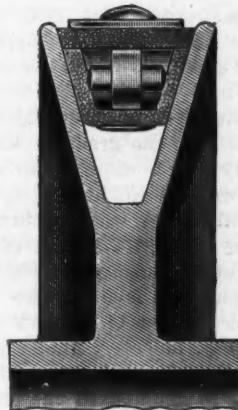


Fig. 2.



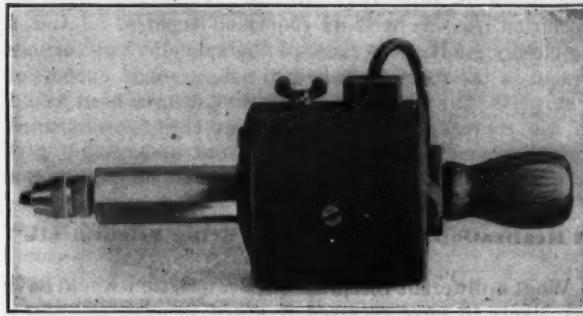
Fig. 3.

Details of the Peerless V Belt.

to the groove in the pulley in which it runs, as seen in the cross section view of the belt and pulley Fig. 2. Fig. 3 shows a piece of the belt on a pulley.

All of the strain upon the belt is borne by the chain, none of it being sustained by the friction casing. Rawhide when not subjected to strain is very lasting, and is not susceptible to injury from dampness; its coefficient of friction is higher than that of belt leather, and it is therefore especially adapted to the service required in this case, since its only function is to supply friction contact. The wedge principle here adopted as a means of securing the necessary friction for transmission service only requires sufficient pressure to give the required adhesion. This is supplied by the weight of the belt itself without the intervention of belt tighteners. The belt may therefore be run slack, thus reducing the tension on the driving side and so minimizing the journal friction. By experiment it has been found that a V groove of 28 deg. angle yields the best results with this belt, since it is at this pitch the best friction is obtained and the belt leaves the groove with practically no loss of power. It is essential that the groove be deep enough so that the belt will not touch the bottom, otherwise there would be little or no wedging effect with consequent loss of friction.

In addition to the advantage of noiselessness, it is claimed that the V belt is well adapted to high-speed transmission. On small pulleys it may be run at a speed of 3000 ft. per min., and on larger ones its travel may be increased to 5000 ft. per min. This belt is at present



The No. O Simple Electric Hand Drill Made by the Willey Machine Company, Jeffersonville, Ind.

the chuck being attached directly to the armature shaft, giving it a high speed suitable for drilling wood or metal up to $\frac{1}{4}$ in. diameter. The drill is regularly furnished with a Jacobs chuck. It is claimed that this drill will be found durable under the rough usage to which tools of this kind are subjected in service.

Canadian Bounties and Company Profits.—Accompanying an offer by the Dominion Securities Corporation of Toronto and Speyer Brothers of London of \$5,840,000 of 5 per cent. first mortgage bonds of the Dominion Iron & Steel Company is a report by Price, Waterhouse & Co., which contains the following interesting figures: "The profits of the company before charging interest and discount on bonds and loans were as follows for the years ending May 31: In 1907, \$2,027,452; in 1908, \$2,710,488; in 1909, \$2,189,909; total, \$6,927,849; average per annum, \$2,309,283. The profits of \$6,927,849 include \$1,870,314 derived from bounties on pig iron and steel ingots, which are on a decreasing scale and terminate December 31, 1910; and also \$1,067,323 from bounties on wire rods which are payable at a uniform rate until the granting act is repealed by Parliament. Including the bounties on wire rods but excluding the terminating bounties on pig iron and steel ingots, the profits for the three years ending May 31 were as follows: In 1907, \$1,722,304; in 1908, \$1,827,375; in 1909, \$1,507,795; total, \$5,057,474, or an average per annum of \$1,685,825. The costs of production have in the past shown a steady reduction, more than keeping pace with the reduction in bounties. In arriving at its profits the company has deducted sinking fund installments and other provisions in lieu of depreciation and exhaustion of minerals, the total for the three years being \$1,073,511, which is, in our opinion, adequate."

Modern Methods and the Business Specialist.

A New Development of Business Practice.

BY ELLSWORTH M. TAYLOR,* NEW YORK.

In the presentation and discussion of the papers at the recent convention in Cincinnati of the American Foundrymen's Association, one point stood out with prominence which was extremely gratifying to those who are interested in observing the progress of scientific and systematic methods in foundry practice and in the practical conduct of manufacturing undertakings generally. It made no difference whether the subject before the meeting was "The Cost of Steel Melting in Foundries," "Continuous Melting," or "The Permanent Mold," there was always present in the discussion an earnest desire to bring out the facts based on systematic, scientific research.

Take for example the questions asked of Dr. Stough-ton after the interesting comparative figures had been shown of "The Cost of Steel Melting in Foundries," again, to be more specific, "Do the costs shown cover all the costs which are incurred up to the ladle?" And again, to be more specific, "Do the casts shown cover all such items as administrative cost, taxes, insurance, depreciation, &c., as well as the usual repairs?" And if one closely studied the faces of the splendid body of men present in the room, he failed to note a single expression of surprise that such a question should have been asked. On the contrary, a quick glance at the faces nearest showed a general acquiescence in and understanding of the question and an acceptance of the raising of the issue as being good and proper.

A Realization of the Need of Being Scientifically Systematic.

What a different reception such a question would have been likely to have received if asked in open meeting a few years back! But the great body of men engaged in the foundry business have been undergoing a course of scientific business education in the past few years, largely under the auspices of the American Foundrymen's Association and allied associations. These men have come to realize that they must not only melt scientifically, handle their material scientifically, but they must operate their properties on up to date, scientific business principles. They must not only be systematic but scientifically systematic, in order to hold their own and to bring foundry practice up to its highest and most economical efficiency.

Just stop to consider the effect of the question, "Did you include the items of taxes, depreciation, insurance, &c., in your comparative figures" on the minds of the men present. Here we have a gathering of sound, practical men who for several years past have had their attention directed to the fact that there is such a thing as a scientific cost of their products, and who, although they may not have installed the scientific method, have come to recognize its existence. Suddenly one of their number asks the question I have quoted, or says, when taking up the matter of continuous melting, "At what point do you consider the continuous melting system to be economically inefficient?" Or "What tonnage is it necessary to melt each day in order to make the continuous melting system profitable?"

These questions bring right up before every man who hears them the vital problem of scientific business methods and costs. Who can answer such questions accurately and authoritatively? The manufacturer who operates his business on a basis of scientific costs. No one else can answer. And when figures are given and a man stands up and questions the items which go to make up the figures, his neighbor, who has only until then tacitly acquiesced in scientific methods, suddenly begins to see the light and silently makes compact with himself to go deeper into the subject of scientific costs. So another step has been taken in the right direction.

How Scientific Business or Cost Methods May Be Introduced.

But how is the man who has had no special training in scientific business or costs methods to introduce them in his business? There are three possible ways:

1. He may do it himself without any assistance except what he may get from reading books and magazine articles on the subject.

2. He may do it himself under the general guidance and with the professional assistance of the man who has made a specialty of business organization and scientific methods and systems.

3. He may place his organization entirely in the hands of the specialist, allowing the latter to come into his business, actually take up the reins and operate the property from day to day until after all the changes have been instituted—the owner of the property taking a back seat in the meantime.

Of these three methods which is the most economical? The second undoubtedly, and in the vast majority of cases that method should be followed.

The first method—"the go-it-alone" idea—is not the best, for the same reason that it is not advisable for the average foundryman to act as his own chemist without undergoing a course in chemistry. Some few men may be able, if they have no other matters requiring constant attention, to take up some books on chemistry and work out for themselves an analysis of all their irons, &c. But how much more quickly, thoroughly and satisfactorily such a man would get his results if he had the guidance and help of the practical and experienced chemist who had met with and mastered basic principles, and could direct his attention unerringly to the correct methods for the solution of the chemical problems which are peculiar to his needs and requirements.

For these reasons the foundry chemist finally has come into his own. There was first the gradual conviction on the part of the foundry owner or manager that the knowledge of the chemist was a valuable aid in the solution of some of the difficulties he was continually trying to overcome. As is the case in all lines of industry when a reform is instituted, considerable chaffing had to be endured by those pioneers who foresaw the value of scientific chemistry as applied to foundry production. The smile of incredulity, however, finally gave place to a sober realization that there was something in it, and then began the rush to get aboard the chemistry band wagon. The foundryman concluded he had enough on his hands without attempting to be his own chemist, and he made arrangements with the specialist either to give him professional consultation at stated periods or to render him service by the year.

The New Specialist is the Growth of Modern Business Necessity.

This is just a little story of evolution, and in relating it I am leading up to the real purpose of this article, which is to call attention again to the evolution of that latest of modern specialists, the exponent of scientific business methods of properly regulated systems, of production costs, organization and accounting.

Like the foundry chemist, this new specialist is the growth of modern business necessity. He was the first to realize the necessity for his work to be synthetic as well as analytic; and to see the peculiar advantages which he possessed by reason of his diversified experience and intimate contact with the details of every character of business. The business world was slow to receive him at first. He met with many a rebuff, but he has surely overcome the prejudice against his employment in this capacity, and the services he renders in it are recognized as valuable and necessary, particularly to manufacturing industries, and equally legitimate with those rendered in his earlier and more widely known capacity.

His field for usefulness is so broad and he is required to have such an intimate knowledge of all business affairs in general that unfortunately, while he is rapidly becoming recognized as a professional specialist, no attempts have been made to apply some special and definite name to describe this branch of his profession.

This phase of the situation is further complicated by

* Member of the Costs Committee of the American Foundrymen's Association.

the desire on the part of individuals and companies engaged in systematizing work alone to adopt a name which will be distinctive and which will appeal to the business world as being a thing by itself, and which may be advertised as something obtainable nowhere else. Perhaps this may have been one of the things which has made the business world withhold its stamp of approval of the work as professional.

Be that as it may, we find men engaged in the work variously classified as "production engineers," "industrial engineers," "business engineers," "systematizers," "specialists in factory organization," "costs experts," "special service experts," "chartered accountants," "public accountants," "certified public accountants," "accountants" (in the broadest sense, of course), and there are numerous other classifications with which the business world is more or less familiar. The scope of the work is so broad that any of these descriptions may be applied to it, and still there is something left to be said. But however these men may be classed, like the chemist, they are here to stay, and there is a steady and increasing demand for their services.

The Qualifications of Business Specialists.

They are required to have, first of all, an intimate knowledge of general shop practice; a broad experience, which means direct contact with many different lines of business and manufacturing; a general knowledge of certain branches of corporation law, commercial law and contracts; an intimate knowledge of the duties of all the executives and heads of departments in the business; a thorough understanding of the science of bookkeeping; an accurate knowledge of the principles and theory of accounts; a knowledge of men, and together with all these things, and above everything else, the professional man's power of concentration and ability to get at the meat of the matter under consideration quickly, and to separate instinctively the essential from the nonessential.

The special knowledge and information which these professional men have of all these subjects create the demand for their services, as there is scarcely a manufacturer in the country who at some time or other has not felt the need of advice along these lines, and the manufacturer is learning that it is to his advantage to consult these men professionally rather than to take the time which would be required to make himself able to arrive at a prompt solution of all the difficulties which he encounters.

It is probably true that in the past too much mystery has been thrown round the work which these professional men accomplish, and the business world has been led to believe that everything they have done is in the nature of a "miracle." This veil of mystery, however, is being rapidly dissipated and the "miracles" have been shown to be due to nothing more or less than a combination of natural qualifications, comprising experience, the scientific application of facts to actual conditions, scientific common sense and a reasonable amount of executive ability. And now that business men recognize the situation they are coming more and more to a realization of the advantages to be gained by using the fund of knowledge, information and experience which these professional men possess.

The Basis of Consultation.

The result is that if the manufacturer to-day feels that he is not operating his business on sufficiently scientific lines, and if he wishes, perhaps, some information in regard to scientific cost methods, he finds that he may consult a specialist professionally at a fee arranged for on the hourly basis, the daily basis, the contract price for the entire work, or an annual retaining fee. In the large majority of cases the business man should be able to get all the assistance he requires by engaging for professional consultation on the daily basis. In this way the specialist will make a personal examination of the points which are causing trouble and will outline definitely the method for overcoming the difficulties. He will then instruct the employees in the share of the work which they are to accomplish, and will exercise only a general supervision over the work until the changes are thoroughly understood.

In other words, in the great majority of cases the business man should be able to secure that class of professional consultation which, acting in an advisory capacity, helps him over his difficulties and does not require to go into a concern and stay there continuously for weeks and months, doing the work which should be done by the employees themselves and which it is the business of the specialist to instruct them in and to see that they accomplish.

There is a growing demand for a class of professional business specialists (if they may be described in this way) who are trained and skilled in all the subjects which have reduced business methods to a science and to whom business men and manufacturers may go for consultation and assistance in mastering any specific points or conditions in his business which are giving trouble, and who may also be called upon to participate actively in the executive management of a business for extended periods of time, if such action is necessary.

The Need of This Class of Service Demonstrated.

If there is a doubt as to the need for the class of service which it has been endeavored to describe, it will be removed by an observation of the general trend of conversation between business men who happen to be traveling in the club or cafe cars of the railroad trains, and who casually enter into friendly conversation. In many instances the conversation will lead up naturally to a discussion of the merits of some new business method or system with which the men may have come in contact.

If this is not sufficient evidence to convince attend some convention, such as that of the American Foundrymen's Association, and note some of the conversations which the men attending the convention will have with the man who is known to be devoting his entire time and attention professionally to the solution of business problems.

For example, the general superintendent of a fairly large manufacturing property employing over 1000 men recently told the writer of the improved conditions which he had been able to secure in his business by such a fundamentally simple matter as an up to date system for handling the thousands of patterns required in his business.

Another practical foundryman volunteered the information that he was a firm believer in scientific business methods, and that he would always insist on the installation of a proper system for keeping track of and handling all materials in any foundry with which he might be connected. This man went on to say further that he was convinced that a method of this kind was the only way to handle materials economically, and that he had first adopted such methods when he had undertaken to operate a foundry on a contract basis for the management. He stated that he was confident he had been paid many times over for the additional trouble he had taken to install such a system when he operated the foundry on the contract basis. In this case all the expenditure for the installation of the system and the cost of maintaining it came out of the pocket of the foundryman, so that his judgment of the importance of the system to him must be considered of value.

Another man of large business experience who some 10 years ago was identified with a prominent manufacturing concern, where he had general charge of the costs system and scheme of organization, but who has been too busy acting in an executive capacity for several corporations for the past few years to give much attention to the details of these two departments, made the statement of his own accord after he had received some consultation and had had a method of up to date scientific costs briefly outlined for him that he had failed to realize, until he had received the professional consultation, what a great advance had been made in operating manufacturing properties on scientific business and cost lines, and that methods which had been followed some years ago were absolutely inadequate to meet the requirements of to-day.

This is an instance where an executive has been so busy pushing the general policy of the business with

which he is connected and keeping pace with the improvements in mechanical appliances that he has been out of touch with the great improvements in scientific methods of business organization.

Business Men Demand Simple and Direct Solutions of Difficulties.

There are a great many men who are owners or managers of manufacturing properties who are in the same position, and this class of men will appreciate more and more the opportunity for occasional consultation with professional business specialists. But they will want this professional information dealt out to them in a sane and safe manner.

If they are experiencing trouble in one or two directions they will not wish to be told that in order to straighten the matter out it will be necessary to put half a dozen representatives of the specialist in the business and keep them there for weeks and months at a time, incurring an expenditure of probably several thousand dollars. The instances where any such action is necessary on the part of a specialist are very few and far between. The class of professional service which the business man demands to-day and will continue to demand more and more in the future, is direct contact with the specialist himself, and simple and direct solutions of the difficulties which present themselves, so that with a reasonable amount of supervision on the part of the specialist the reforms may be instituted by the owners of the business with the assistance of their own clerical force.

When seeking professional services the business man should remember that he is not buying materials or merchandise. He is buying information and experience; consequently it is necessary, if he is to receive the best he can find, for him to depart a little bit from the regular traditions of the purchasing agent. He should realize that there is a difference in the quality of services which may be rendered, and that it is hard to apply the ordinary rules of buying in arranging for the services. If he is able to arrange for this professional consultation on the hourly or daily basis, reserving the privilege of terminating the service at his discretion, he certainly does not run any great risk of being involved in unlimited expenditure and may rest assured that the specialist is working absolutely on his merits and with the confidence, born of experience, that he will be able to solve the business man's troubles in a reasonable time and with entire satisfaction. This is the class of service which appeals to business men and which it is possible for the business man to obtain to-day.

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An Accelerated Test of Road Wear by Automobile Traffic.

Unusual circumstances, says the *Engineering News*, subjected a short stretch of road in eastern Germany to very heavy traffic of automobile busses for a period of five months during the winter 1907-1908, and in that period some interesting studies of road wear were made. The traffic was much heavier, both in amount and in loading, than normally occurs even on heavily traveled main highways, and the results represent what might be called an accelerated test of road destruction by motor car traffic. The matter has recently been reported in the *Zentralblatt der Bauverwaltung* (June 5, 1909). The showing made is rather alarming, but in reality it only puts into specific figures what has been more or less generally recognized as true.

A railroad tunnel between the towns of Mettlach and Ponten caved in November 27, 1907; this interrupted the line from Trier to Saarbrücken and necessitated the employment of auxiliary means of transportation to bridge the gap for passengers and baggage. An average of 10 passenger trains each way per day had to be taken care of. For a fortnight local vehicles, such as cabs, farm wagons, &c., were employed. On December 6 two closed motor cars holding 12 to 15 passengers each were obtained. A week later 10 large motor busses belonging to the Grosse Berliner Motor Omnibus Company were put into service on the portage and the two smaller busses

were dismissed. These 10 busses were in service till early in February, when four of them burned, after which the remaining six handled the service.

The tunnel was restored ready for traffic by May 1, 1908, making the period of road portage practically five months. During this time the motor busses averaged 80 trips between Ponten and Mettlach, though in the Christmas weeks the number of trips was increased to as high as 140 per day.

The stretch of road in question, excluding the terminal portions which lay in paved streets, is slightly under two miles long. A short stretch near the middle is level, lying on the ridge through which the railroad tunnels, while the rest is steeply sloped down toward the two ends. The northerly slope averages 6.9 per cent. grade, the southerly slope 8 per cent. The road had a broken stone pavement, generally a kind of Telford, i. e., there was a base course of shingle or cobbles. The upper course consisted of quartzite, stated to be very suitable for road purposes. The age of the road surfacing varied, but the important feature is that the older parts had been kept in careful repair, and the entire two mile length was in first-class condition.

Perceptible wear began when the large motor busses came into service. A picking-up action was noticed in the tiretracks, and in a few days the road was covered with fragments of stone torn out of the surfacing. These large busses are described as follows: Weight, empty, 13,000 lb., of which nearly 9500 lb. was on the rear axle; capacity, 25 passengers; weight loaded, about 17,000 lb.; tires, solid rubber, width 4 in. front, 8½ in. rear; gauge, 5.9 ft. front, 6.6 ft. rear; speed, 6 to 15 miles per hour.

The rutting of the road once started, it developed in a short time so far as to form grooves up to 6 in. deep by 12 in. wide, and ridges formed alongside the ruts from the displaced material. The ruts were not clean but contained much loose material, which the following wheels either pushed aside or crushed. Repair work was started as soon as the destructive actions were noticed, and was continued to the end of the period. Coarse broken stone was placed in the ruts and pressed down with a steam roller, whereupon a binding course of small stuff, such as cinders and coarse sand, was similarly applied. This could be done only when the road was not frozen.

Two weeks often sufficed to destroy the repair work completely. During the last three months it was a constant struggle to keep the road in passable condition. If heavy continued rains had occurred in March or April it would have been impossible to maintain the traffic. The wear and grooving was worse in December. Freezing weather in January and the first part of February held matters stationary and preserved the road, though in badly rutted condition. Thereafter the southerly slope thawed first, and repair work was concentrated on it, the northerly slope being taken up later.

The five months' maintenance cost about \$4000, or over \$2,000 per mile. About 1250 cu. yd. broken stone and an undetermined amount of sand and cinders were used. M. Görz, who reports the details, says that but for good weather, a convenient supply of materials and the availability of labor from the railway department it would not have been possible to keep up the road. These favorable factors, we conclude, also operated to reduce the cost.

The influence of the heavy weight concentrations upon the destruction of the road was evident in one of the paved streets at one end of the route. A street newly paved with stone block, but apparently without concrete base, was used temporarily to detour around the main street. But in a few days the surface was deeply grooved, the wheels crushing the stone blocks down into the soil, and the busses had to use another street.

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The latest issue of *Reaction*, a quarterly, published by the Goldschmidt Thermit Company, 90 West street, New York, contains the following leading articles: "Welding Conductor Rails," an account of the work done for the Metropolitan Railway of Paris; "Thermit Welding in Argentine Republic," and "Thermit Rail Welding in Los Angeles, Cal." Several other articles have to do with locomotive repairs and other uses of thermit.

Dunderland Iron Ore Concentrates.

Proposed Substitution of the Gröndal for the Edison Process.

From time to time publication has been made of the difficulties encountered by the Dunderland Iron Ore Company, Ltd., in operating its extensive plant at Guldsmedvik i Ranen, Norway, in which the Edison process has been employed for the concentration of hematite and magnetic iron ores, chiefly the latter. Up to the starting of the plant early in 1906 more than \$10,000,000 had been spent by the company, which chiefly represents British iron and steel interests, and further considerable outlays have been required in the intervening years. A receivership resulted from the heavy financial demands of the project, and for some months operations have been at a standstill. From the London *Statist* the following account is taken of the cumulative misfortunes that have attended the enterprise. At the outset the plans of the company looked to the handling of 5000 tons a day of crude ore and the production of 2500 tons of briquettes daily.

A Chapter of Mischance.

Though formed under the most influential and promising auspices for the purpose of acquiring large ore deposits in Norway, and by means of a process patented by Mr. Edison converting the low grade ore into practically nonphosphoric high grade ore, the company was very soon faced with difficulties and considerable delays occurred. It was found necessary to construct a railroad, build bridges, construct a pier and dredge the harbor basin so as to obtain sufficient accommodation for shipping to meet its requirements. In the first year there was a bad land slide which blocked the railroad for some months; then delay was experienced in the delivery of the steel work for the bridges; later, mechanical difficulties were experienced in carrying out the process satisfactorily, and after preliminary trials were made, it was found that considerable alterations would be necessary before the plant could be run regularly on a commercial basis. Among other difficulties may be mentioned: 1, excessive dust and spillage from conveyor belts; 2, shortage of labor, due principally to the dust condition and partly to the lack of adequate housing accommodation; 3, conveyor breakdowns; 4, imperfect drying of the crushed ore; 5, inefficiency of the hematite magnets without automatic cleaners, &c. By this time the company had come to an end of its working resources, and the lack of progress made had caused considerable difficulties in raising further funds. During last year, in order to provide further funds, prior lien debentures to the amount of £100,000 were issued to the Consolidated Goldfields of South Africa, Ltd., to secure advances up to £80,000.

The Debenture Stockholders' Committee, appointed in September last, has now issued a circular proposing that steps should be taken to raise £250,000 for the purpose of paying off advances of the Consolidated Goldfields and providing further capital for installing plant for the purpose of working the Swedish process already alluded to. D. A. Bremner, the general manager of the company, had reported to the committee in November last that to work the Edison process properly certain alterations would be required to the existing plant and machinery, for the purpose of removing the difficulties and defects in the process, which would cost £123,000. The committee came to the conclusion that "they could not recommend the raising and expenditure of further moneys on an attempt to cure the defects in the existing separating plant, which appeared to them not to have sufficient assurance of success to warrant its being made."

The Gröndal Process Favored.

The committee then inquired into the possibilities of the Swedish process which had been brought to their notice by Mr. Bremner, the process in question being the Gröndal wet magnetic separation, while the Edison process is a dry one. The results of some trials convinced the general manager of the practicability of applying the Gröndal process at Dunderland. The reduction of the hematite into lower magnetic oxide is effected by roasting the coarsely ground ore in a rotary furnace fired with producer gas, the ore on its way into the furnace being mixed with from 1 to 1½ per cent. of fine coal. The conversion of the hematite into magnetite proved to be regular and complete. The whole of the magnetite product from the furnace was subsequently treated by the Gröndal wet magnetic concentration process with highly satisfactory results, and the results of the tests show that from the average grade of Dunderland ore there can be obtained by means of the conversion and wet concentration processes a concentrate containing not less than 68 per cent. of iron and not more than 0.025 per cent. phosphorus with

a yield of 45 per cent., or one ton of concentrates from 2.22 tons of crude ore and a minimum recovery of 90 per cent. of the available iron. The following is a comparative statement of the results obtained with the dry process and the Gröndal wet process:

Dunderland Iron Ore Company.—Estimated Results of Dry and Wet Concentration.

	*Dry concentration.	Gröndal wet concentration.
Recovery of available iron in the crude ore in per cent.....	60 %	90 to 95 %
Yield of concentration in per cent.....	33 ½ %	45 %
Tons of crude ore required to produce 1 ton of concentrates.....	3 tons	2.22 tons
Per cent. of iron contained in the concentrates.....	64 %	68 %
Per cent. of phosphorus contained in the concentrates.....	0.032 %	0.025 %
Tonnage of concentrates produced from 900,000 tons of crude ore.....	300,000 tons	400,000 tons
Estimated average annual profit on basis of average price realized in the past, viz., 28s. 3d. per ton.....	£256,000	...
Estimated average annual profit on a basis price of 17s. per ton for 50 per cent. Rublo ore.....	£100,000	...

* The fulfillment of this estimate would be conditional upon the carrying out of improvements and alterations to the existing plant, which would involve a capital expenditure of about £87,000, plus £21,000 for maintenance, repairs and overhaul of machinery and plant, making a total of £108,000, apart from administration expenses estimated at about £15,000. It is pointed out, also, that there is a considerable element of uncertainty as to the practical success of the dry process, even if this expenditure were incurred.

The committee are of one opinion that Mr. Bremner's estimates may be relied upon. They think, however, that it would be advisable in the first instance to install one Gröndal unit with a capacity of 20,000 tons of concentrates per annum and to work that unit under commercial conditions for a period of three months, so that the new conversion process may be thoroughly proved. At the same time it is considered that the company should proceed to work a deposit of about 3,300,000 tons of magnetite ore, which can be mined independently of the hematite. Stress is laid on the fact that the Gröndal process is a proved process for dealing with magnetite, so that all that will be required will be the installation of 10 units of the Gröndal separating plant (one of which would be used for the hematite to be magnetized in the trial conversion furnace) at an estimated cost of £70,000. This installation could be completed in about 12 months, and then the company would be in a position to produce 200,000 tons of concentrates per annum, viz., 180,000 tons from magnetite ore and 20,000 tons from hematite converted into magnetite in the single conversion furnace proposed to be installed. On an output of 200,000 tons of concentrates a profit of £50,000 per annum is estimated. It is estimated that the full amount which will be ultimately required, including provision for redemption of the £250,000 now proposed to be raised and about £80,000 for working capital, will be £500,000.

The Vatudrip Rust Preventive.—The Vatudrip Company, 237 Broadway, New York, is exhibiting samples of sheet steel which have been tested for the purpose of showing the excellent results accomplished through the use of its rust preventive. One sample was treated on both sides with fluid Vatudrip and was exposed to the weather from January 2, 1909, until July 1. A portion of the solution was then removed, showing the surface of the steel as bright as on the day when the exposure was first made. The remainder of the surface is still covered with the solution, which retains its moist condition, being evidently in shape to protect the metal for a very much longer period of time. Of another sample, one-half was treated with Vatudrip, after which the steel was exposed to the weather for six months. The part of the steel which was treated retains its thoroughly bright surface, while the portion which was not thus treated is heavily rusted. The contrast between the two portions of the steel is most marked, showing the admirable protection afforded by the solution.

The Maryland Steel Company has placed a contract with the Wellman-Seaver-Morgan Company, Cleveland, Ohio, for gas producers for the new open hearth steel plant at Sparrows Point, Md. These producers will be of the well-known Hughes continuous mechanically stirred type. The producers will embody the latest improvements and will be equipped with the Hughes patent ash cleaning hopper. This installation is a distinct advance in open hearth steel practice, the adoption of the self-cleaning ash hopper insuring a uniform discharge of ashes from the producer, besides effecting a substantial saving in the cost of gas-house labor.

New Autogenous Welding Equipment.

For the use of garages and small repair shops the Davis-Bournonville Company, New York City, has placed on the market an oxy-acetylene welding equipment known as the D-B Junior outfit. This is to fill the demand for a smaller and less expensive apparatus than the average garage or machine shop requires when it only does odd repairs and does not make a special business of welding.

The Junior outfit includes one torch with five sizes of tips, enough to do any of the variety of work which would come to the ordinary small repair shops; and as, owing to insurance regulations, the majority of these could not install acetylene generators in their plants and most of them have no space available outside of the building in which to place the generators, a 125-cu. ft. dissolved acetylene cylinder is supplied. This gives a sufficient supply of gas to do a large number of jobs, and a full cylinder is shipped immediately upon receipt of



Fig. 1.—The D-B Junior Outfit Made by the Davis-Bournonville Company, New York City.

the bill of lading of the empty one. An oxygen cylinder is also supplied with the equipment, which is shown complete in Fig. 1.

The torch and other fittings are not quite the same as the regular equipment put out by this company, but the difference is mainly in finish. The equipment does not in any way sacrifice the economy, efficiency and reliability of the larger equipment, the high pressure feature, together with all its advantages, being retained. The purchasers' operators are instructed in the use of the apparatus by the manufacturer.

The advantage of having such an equipment is obvious, as those installing it are in position to save their customers considerable in time, money and annoyance by repairing broken parts that would otherwise have to be replaced, such as cast iron cylinders, aluminum crank and gear cases, as well as malleable axle housings, &c.

Among the dealers in Davis-Bournonville apparatus is the Autogenous Welding Equipment Company, Springfield, Mass., the president of which, Henry Cave, is the inventor of the table of rather peculiar construction shown in Fig. 2. It was developed originally for use in

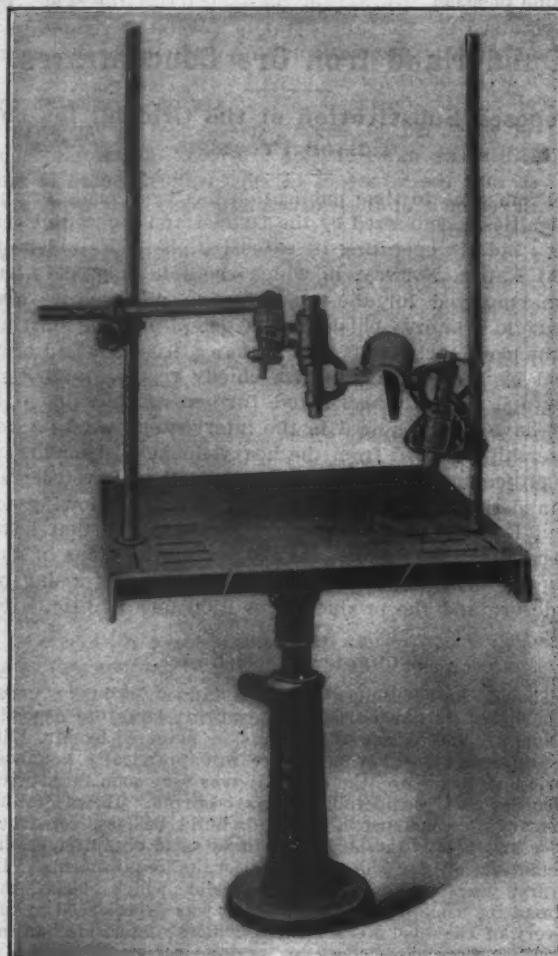


Fig. 2.—A Table and Supports for Holding Work While Welding, Made by the Autogenous Welding Equipment Company, Springfield, Mass.

this company's repair shop, as it not only sells the apparatus, but does a jobbing business in oxy-acetylene welding. The table has a substantial top 30 in. square, with well arranged slots so that broken parts can be lined up and bolted into position. The top is carried on a ball and socket joint, which can be held securely by a single screw in any position, making it possible to tilt the table to a slight angle in all directions and to a right angle

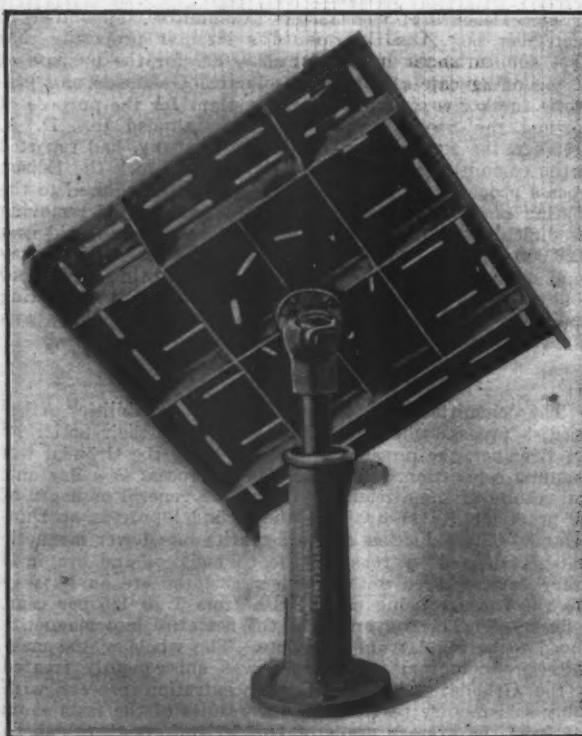


Fig. 3.—A Rear View of the Table Tilted.

in one position. In any of these positions the table can be revolved so that any point of the piece strapped on the table can be brought into any position for the operator to work on it.

The bolt is supported in a socket on a pedestal, the base of which can be secured to the floor by lag screws. The ball socket is carried on a separate telescopic member, so that the table can be raised and lowered to suit the convenience of the workman, being supported in the

Plata, with not a tenth of its territory in actual production. It certainly seems ripe for railroad, mining and industrial enterprises.

The 5 per cent. Treasury bonds of the State of São Paulo, guaranteed by the Brazilian Government up to the full issue of \$75,000,000, are now quoted at a high point, especially due to the guarantee of 7,000,000 or 8,000,000 bags of coffee now in America and Europe, at the disposal of the Brazilian Government. All the São Paulo

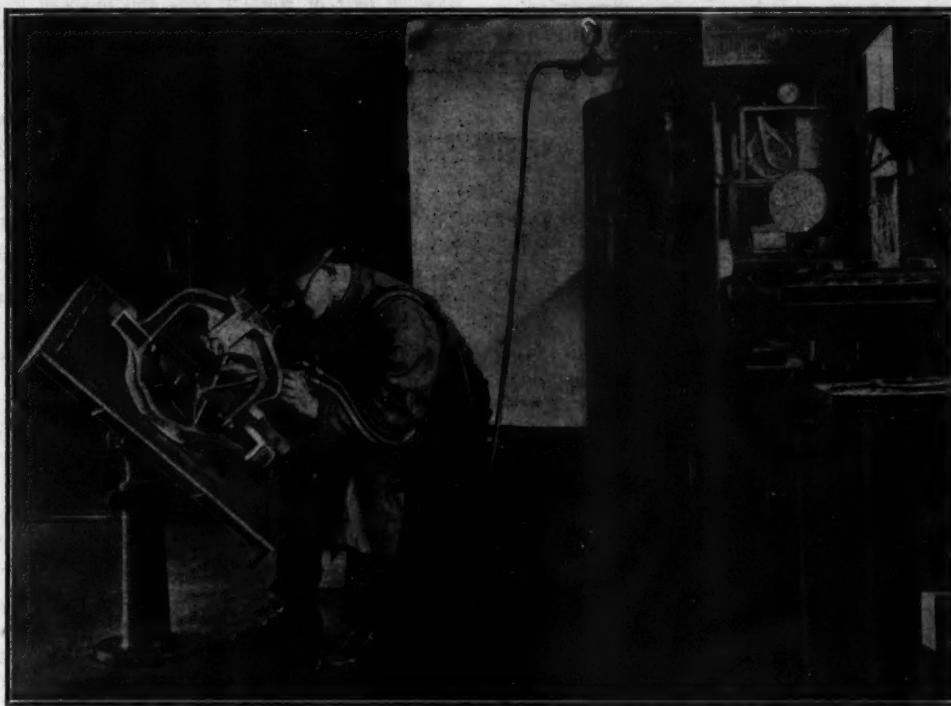


Fig. 4.—The Welding Table in Use.

different positions by notches in the side of the slot. Two edges on the top have a flange projecting downward at right angles, so that work to be held in a vertical position can be securely clamped thereon. The top of the table is machined, so that work can be lined up accurately; and the under side is well ribbed, as can be seen in Fig. 3, so that it cannot be sprung. Fig. 4 shows the table in use.

The above company has also placed on the market a universal clamping fixture to be used in connection with this table. This consists of two universal vises that can be held rigidly in any position by arms and pillars, so that broken parts can be held in proper relation while they are being welded. This is a valuable accessory, as it has been found by experience that more time is consumed in finding means of lining up small broken parts than is consumed in their welding, when some such appliance as the above is not available.

Central and South American Notes.

SAN JOSÉ, C. A., June 15, 1909.—The Boliviens are showing great interest in the enterprise carried on by an American syndicate, which is extending the Antofagasta Railroad, now running from Oruro to Vicha, northward and southward and into the interior. About \$20,000,000 of bonds, 5 per cent., are on the market to carry on this work, most of which is in the hands of American bankers and syndicates. Back of this important concession are the Supreme Court and the Government of Bolivia. For a country which has few railroad lines the carrying out of this road is necessarily of the greatest value. The Bolivia-Antofagasta line is one of the highest (in altitude) in the world. It will eventually open up traffic in several important mining regions, reaching a number of large towns also.

Bolivia is a brand new country for American enterprise. It is full of the richest natural products, forests of hard woods, rubber, sarsaparilla and dyestuffs on the east; gold, silver, copper, iron, platinum and tin mines on the west, and immense navigable rivers running north and south, eventually to join the Amazon or the Río de la

railroads are working well, and the extensions westward have resumed work since the arrival of several cargoes of steel rails, bridges and rolling stock.

The new government of Venezuela is getting engineers from the United States to study the country's conditions as regards canals and irrigation problems. From England it will get mining experts, geologists from France and forestry experts from Germany. If Venezuela could only have peace for a few years its vast semitropical and tropical treasury could be developed by Americans and American capital. Practically we only know this country for its asphalt and its coffee, whereas a few hundred miles of railroad could easily open up a country teeming with cattle and wealthy in agriculture and mining, with a population which would gladly avail itself of the chance of buying our goods in return. The present government understands also the need of dredging its two most important ports, La Guayra and Puerto Cabello. These also need modern piers and a number of steel, fireproof "aduana" or custom house buildings.

The British authorities are again agitating the question of building the Belize (British Honduras), Guatemala & Mexico Railroad. The port of Belize on the Atlantic (or Caribbean Sea) is the eastern terminus, the ports of Champerico (Guatemala) and San Benito (Mexico) are the Pacific termini. The country which this line would tap is rich in agricultural products, cacao, coffee, tobacco, fruit, &c. Much of the interior is covered with mahogany, logwood and ebony forests. At present millions of dollars' worth of these woods are floated down the Usumacinta and its tributaries to the sea, but a dry season often causes a loss of 50 per cent. of the lumber.

A number of new bridges and culverts are being ordered for the Guatemala Central and Northern railroads. The extension to Antigua is being considered, as is also the deepening and cleaning out of the port at Puerto Barrios.

It is now proposed to rebuild and further extend westward the Puerto Cortez (Honduras) lines; once the highlands of Comayagua are reached it will be relatively easy to connect with the Pacific Ocean at Amapala. c.

The Progress of Tariff Revision.

The Bill Now in the Conference Committee.

WASHINGTON, D. C., July 13, 1909.—The tariff bill, after three months of uninterrupted consideration, was passed by the Senate a few minutes before midnight on the 8th inst., was returned to the House for concurrence in the Senate amendments at noon on the following day and, the amendments being rejected en bloc, the measure was referred to a Conference Committee, which is now engaged in the work of harmonizing the disagreeing provisions of the two Houses. The committee is composed as follows:

Conferees on the part of the Senate: Senators Aldrich of Rhode Island, Hale of Maine, Burrows of Michigan, Penrose of Pennsylvania and Cullom of Illinois, Republicans; and Daniel of Virginia, Money of Mississippi and Bailey of Texas, Democrats.

Conferees on the part of the House: Representatives Payne of New York, Dalzell of Pennsylvania, McCall of Massachusetts, Bouteill of Illinois, Fordney of Michigan and Calderhead of Kansas, Republicans; and Clark of Missouri, Underwood of Alabama and Griggs of Georgia, Democrats.

It will be noted that the House conferees will be nine, while those on the part of the Senate are but eight, the Speaker having appointed six Republican members of the Ways and Means Committee instead of five, which is the usual number. While this action is important, its significance is likely to be misunderstood. It does not, as would at first appear, give to the House conferees any greater influence than those of the Senate, for the conferees on the part of each House vote as a unit and on all controversies the balloting proceeds until both unit votes are cast for the same proposition. Viewed from another standpoint, however, the action of the Speaker in appointing an additional Republican member to the committee is suggested and may have an important influence on the outcome. By adding Representative Fordney the Speaker has materially strengthened the high tariff representation, as the Michigan member is an outspokenly thorough protectionist. It will be seen, therefore, that by increasing the number of the House conferees the Speaker has actually reduced the influences in the Conference Committee of the House, which stands for lower duties, and has correspondingly increased that of the Senate, which favors either the Dingley rates or the smallest possible reductions therefrom.

As predicted in this correspondence, the bill as finally passed by the Senate was practically in the form in which it was reported from Committee of the Whole. In the metal schedule, the text of which as perfected in Committee of the Whole appeared in *The Iron Age* of last week, but seven paragraphs were amended and the majority of these changes were unimportant.

Boiler Plates.

On motion of Senator Aldrich an amendment reported from the Finance Committee readjusting the rates on boiler plates as covered by paragraph 120 was adopted, the paragraph as amended reading as follows, the text of the House measure appearing in roman, those portions of the House bill stricken out being embraced in brackets, and the new matter added by the Senate printed in italics:

120. Boiler or other plate iron or steel, except crucible plate steel and saw plates hereinafter provided for in [sections one or two of this act] *this section*, not thinner than No. 10 wire gauge, cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at [one cent per pound or less, three-tenths of one cent per pound; valued above one cent and not above two cents per pound, four-tenths of one cent per pound; valued above two cents and not above four cents per pound, seven-tenths of one cent per pound; valued at over four cents per pound, twenty per centum ad valorem] *eight-tenths of one cent per pound or less, three-tenths of one cent per pound; valued above eight-tenths of one cent and not above one cent per pound, four-tenths of one cent per pound; valued above one cent and not above two cents per pound, five-tenths of one cent per pound; valued above two cents and not above three cents per pound, six-tenths of one cent per pound; valued at over three cents per pound, twenty per centum ad valorem.* Provided, That all sheets or plates of iron or steel thinner than No. 10 wire gauge shall pay duty as iron or steel sheets.

In explanation of the changes made by the committee amendment, Senator Aldrich stated that there was a re-

duction in two rates and an increase in one, the net difference being inappreciable.

Railroad Fish-Plates.

Senator Aldrich also reported from the Finance Committee an amendment increasing the rates on railroad fish plates or splice bars made of iron or steel from two-tenths of one cent per pound to three-tenths of one cent, the paragraph as amended reading as follows:

124. Railway bars, made of iron or steel, and railway bars made in part of steel, T rails and punched iron or steel flat rails, seven-tenths of one cent per pound; railway fish plates or splice bars, made of iron or steel, [two-tenths] *three-tenths* of one cent per pound.

Galvanized Sheets.

Senator Burton of Ohio offered the amendment heretofore described in this correspondence increasing the surtax on galvanized sheets from two-tenths of one cent per pound to four-tenths. Senator Aldrich, on behalf of the Finance Committee, opposed the increase on the ground that it was excessive, but finally consented to a compromise rate of three-tenths of one cent, which was agreed to by the Senate, and the paragraph passed in the following form:

126. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates, and taggers tin, and hereinafter provided for, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall pay [two-tenths] *three-tenths* of one cent per pound more duty than if the same was not so galvanized or coated; sheets or plates composed of iron, steel, copper, nickel, or other metal with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, [forty-five] *forty* per centum ad valorem.

Ores Containing Arsenic.

At the instance of Senator Jones of Washington the Senate agreed to incorporate in the metal schedule a new paragraph providing a duty on ores containing arsenic, which heretofore have been carried on the free list. Senator Jones stated that the free listing of arsenic reduced the value of ores carrying that product, but did not cheapen the arsenic itself, smelters being unwilling to save the by-product at ruling prices, thus leaving the market at the mercy of foreign producers, who manipulated it to suit their own interests. The paragraph as adopted reads as follows:

117*½*. Ores containing arsenic, one and one-half cents per pound on the arsenic content therein; white arsenic or arsenious acid, two cents per pound.

Nickel.

On motion by Senator Briggs of New Jersey the duty on sheets and strips of nickel was changed from six cents per pound to 35 per centum ad valorem, and provision specifically made for wire at the same rate. The paragraph as adopted is as follows:

183. Nickel, nickel oxide, alloy of any kind in which nickel is a component material of chief value, in pigs, ingots, bars, rods, plates [sheets, and strips cut from sheets], but not rolled or drawn, six cents per pound, *sheets, strips and wire, thirty-five per centum ad valorem.*

Watches, Etc.

Senator Lodge of Massachusetts, on behalf of the Finance Committee, reported several amendments to paragraph 189 relating to watches, &c., with a view to simplifying the requirements as to the marks showing the country of origin; also increasing slightly the duties on dials. The text of the section as finally adopted in the form of a complete substitute for the House provision is as follows:

189. Watch movements, including time-detectors, whether imported in cases or not, if having not more than seven jewels, sixty-five cents each; if having more than seven jewels and not more than eleven jewels, one dollar and thirty-five cents each; if having more than eleven jewels and not more than fifteen jewels, one dollar and eighty-five cents each; if having more than fifteen and not more than seventeen jewels, one dollar and twenty-five cents each and twenty-five per centum ad valorem; if having more than 17 jewels, three dollars each and twenty-five per centum ad valorem; watch cases and parts of watches, chronometers, box or ship, and parts thereof, forty per centum ad valorem; lever clock movements having jewels in the escape-ment, and clocks containing such movements, one dollar each, and forty per centum ad valorem; all other clocks and parts thereof, not otherwise provided for in this section, whether separately packed or otherwise, not composed wholly or in part of china, porcelain, parian, bisque, or earthenware, forty per centum ad valorem; all jewels for use in the manufacture of

watches or clocks, ten per centum ad valorem; enameled dials for watches or other instruments, costing not more than ten cents each, one and one-half cents per dial and forty per centum ad valorem; costing more than ten cents each, three cents per dial and forty per centum ad valorem: Provided, That all watch and clock dials, whether attached to movements or not, shall have indelibly painted or printed thereon the country of origin, and that all watch movements, lever clock movements with jewels in the escapement, and cases of foreign manufacture shall have the name of the manufacturer and country of manufacture cut, engraved or die-sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and the movements shall also have marked thereon by one of the methods indicated the number of jewels and adjustments, said number to be expressed both in words and in Arabic numerals; and none of the aforesaid articles shall be delivered to the importer unless marked in exact conformity to this direction.

Machinery.

On motion by Senator Piles of Washington a proviso was added to paragraph 194 authorizing the free entry of machines used for spreading tar and oil on roadways, the section as finally passed reading as follows:

194. Cash registers [electrical machinery, jute manufacturing machinery], linotype and all typesetting machines, machine tools, printing presses, sewing machines, typewriters and all steam engines, thirty per centum ad valorem; embroidery machines and lace-making machines, including machines for making lace curtains [nets, or nettings], forty-five per centum ad valorem: [Provided, however, That all embroidery machines and lace-making machines, including machines for making lace curtains, nets, or nettings, imported prior to July 1, 1911, shall be admitted free of duty] Provided, however, That all machines used for the manufacture of linen or cloth from flax and flax fiber, imported prior to January 1, 1912, shall be admitted free of duty: Provided further, That tar and oil spreading machines used in the construction and maintenance of roads and in improving them by the use of road preservatives, shall be admitted free of duty.

Attempt to Abolish the Tin Plate Drawback.

A strenuous effort was made by Senator Beveridge of Indiana to induce the Senate to adopt an amendment providing that "the drawback provisions of this act shall not apply to any articles manufactured in whole or in part of tin plates, terne plates and taggers tin." In support of his amendment Senator Beveridge said in part:

Under the present indiscriminate drawback provisions of our law perhaps the greatest business organization in the world gets its tin plate in Wales, brings it here, manufactures it into cans and containers, and then ships it out again, getting all of the tariff that it paid when it brought the tin in as a drawback, excepting only 1 per cent. That great concern, as everybody knows, is the Standard Oil Company. . . . It is estimated by the laborers engaged in this great industry that if this concern and other concerns who buy their tin plate in Wales were to buy it here, it would keep as much as 30 tin plate mills going in addition to those we now have. I do not know whether that estimate is correct or not; but it must be patent to all that if they bought their tin plate here, where they have derived their great wealth, they would certainly keep every tin plate mill now in existence in full operation at full wages.

Senator Dolliver of Iowa suggested to Senator Beveridge that when the Dingley act was passed an effort was made to abolish the drawback on tin plate, but that it was demonstrated that if the privilege should be withdrawn "it would not operate to stimulate the purchase of tin plate here, but would operate to stimulate the manufacture of tin cans in Hongkong and other Asiatic centers for the distribution of oil in tin cans; that the Standard Oil Company and other exporters of oil would carry in bulk in tank steamers their oil to the places where they would be ready to ship to the interior of Asiatic countries, and that instead of resulting in the patronage of our own tin plate mills it would result in the purchase of foreign tin plate and the manufacture of oil cans and containers in Hongkong or other Eastern cities, where it could be done very cheaply."

Senator Aldrich asserted with much emphasis that Senator Beveridge's position as to tin plate was wholly untenable. Not less than \$75,000,000 worth of general exports, including oils of various kinds, meat products, vegetables, fruits, tobacco, &c., is now marketed abroad in tin containers with benefit of drawback of duty paid on the foreign plate used in their manufacture. In many cases this foreign business could not be obtained if the exporters were obliged to use containers made of domestic tin, and in some cases the business was done on so small a margin that the profits of the American producer

did not exceed the drawback on the plate used in the manufacture of containers. If the drawback should be stricken out the domestic plate mills would not secure any substantial increase in their orders for the reason that wherever possible the commodities would be shipped abroad in bulk and there canned, while in many cases the export business would have to be sacrificed and the growers and producers of vegetables, fruits, meats, &c., would suffer a heavy loss without any gain to the tin plate manufacturers or their operatives. Senator Beveridge's amendment was thereupon rejected.

Free Entry for Tools, Farming Implements, Etc., Denied.

Senator McLaurin of Mississippi appealed to the Senate to consent to the addition to paragraph 712 of the free list of the following proviso granting free entry to tools, farming implements, &c.:

Notwithstanding anything in this bill contained, trace chains, lock chains, log chains, and all other chains used on a farm; plows, plow handles, plow beams; screws used on, in, or about plows, coulters, lap rings, clevises, clevis pins, buck heads, singletrees, doubletrees, cuffs and hooks for singletrees and doubletrees; horse collars, hames, hame strings, backbands, plow lines, bridles and all other plow gear; saddles, wagon harness, buggy harness, carriage harness, pitchforks, spades, spade handles, shovels, shovel handles, axes and handles, hoes of all kinds, hoe handles, reapers, harvesters, mowers, pea-vine pullers, scythes, scythe blades, reap hooks, grass blades, lawn mowers, rakes, hammers, hammer handles, hatchets, hatchet handles, and all other farming implements, and all carpenters' tools and all blacksmiths' tools, when imported into this country, shall be admitted free of duty.

Senator Aldrich promptly moved to lay this amendment on the table, the Senate concurring without the formality of a roll call.

W. L. C.

Australian Vessel and Railroad Building.

MELBOURNE, May 22.—At last a definite step has been taken toward the establishment of an Australian navy for coast defense. Three torpedo boat destroyers is the opening order and a joint contract with William Denny & Brothers of Dumbarton, England, and the Fairfield Shipbuilding Company of Glasgow, Scotland, has been entered into. Two of the vessels are to be launched in England and brought out under steam. The contract price for each is £81,500. The third is to be packed and shipped and put together in Australia. About a dozen Australian artisans have been sent to the mother country to acquire experience in the above named shipyards, with a view to using their knowledge in the subsequent construction of vessels locally. The Commonwealth Defense scheme provides for the construction of about a score of these torpedo boat destroyers, although the proposal has not yet received parliamentary sanction.

Various schemes are in hand throughout the states in the direction of opening up new country by railroad construction. A small stream of immigration is setting in, and added facilities for transit will do much to break up the concentration of people in the cities. At present nearly half of Australia's total population of 4,275,000 is concentrated in the large towns. It is interesting to note that New South Wales leads the way with 1,591,000, Victoria being second with 1,271,000 and Queensland third with 552,000.

Steel rails for new construction are being landed in large shipments, more especially in New South Wales. This state now has 3567 miles of railroad; in addition 179 miles are under construction, 382 more have been authorized by Parliament and an additional 280 will in all probability be authorized for construction very shortly.

G. J. and C. H. Hoskins, directors of G. & C. Hoskins, proprietors of the Lithgow Iron Works and various other iron industries, are now on a trip through England and America.

A Koppers by-product coke oven specially designed for the experimental treatment of Western fuels is being built for the Colorado Fuel & Iron Company, Pueblo, Colo. If the trial unit proves satisfactory, it is understood that a plant comprising 350 to 360 ovens of this type will be installed.

A Pelton-Francis Turbine Installation at Schaghticoke, N. Y.

A 20,000-hp. installation of Pelton-Francis vertical shaft turbines built by the Pelton Water Wheel Com-

connection with another plant at Johnsonville, about five miles farther up the Hoosic River, is an especially interesting one from the manner in which the problems peculiar to the conditions have been solved. The principal thing is that the disadvantages of fluctuating stream flow have been overcome by the arrangements

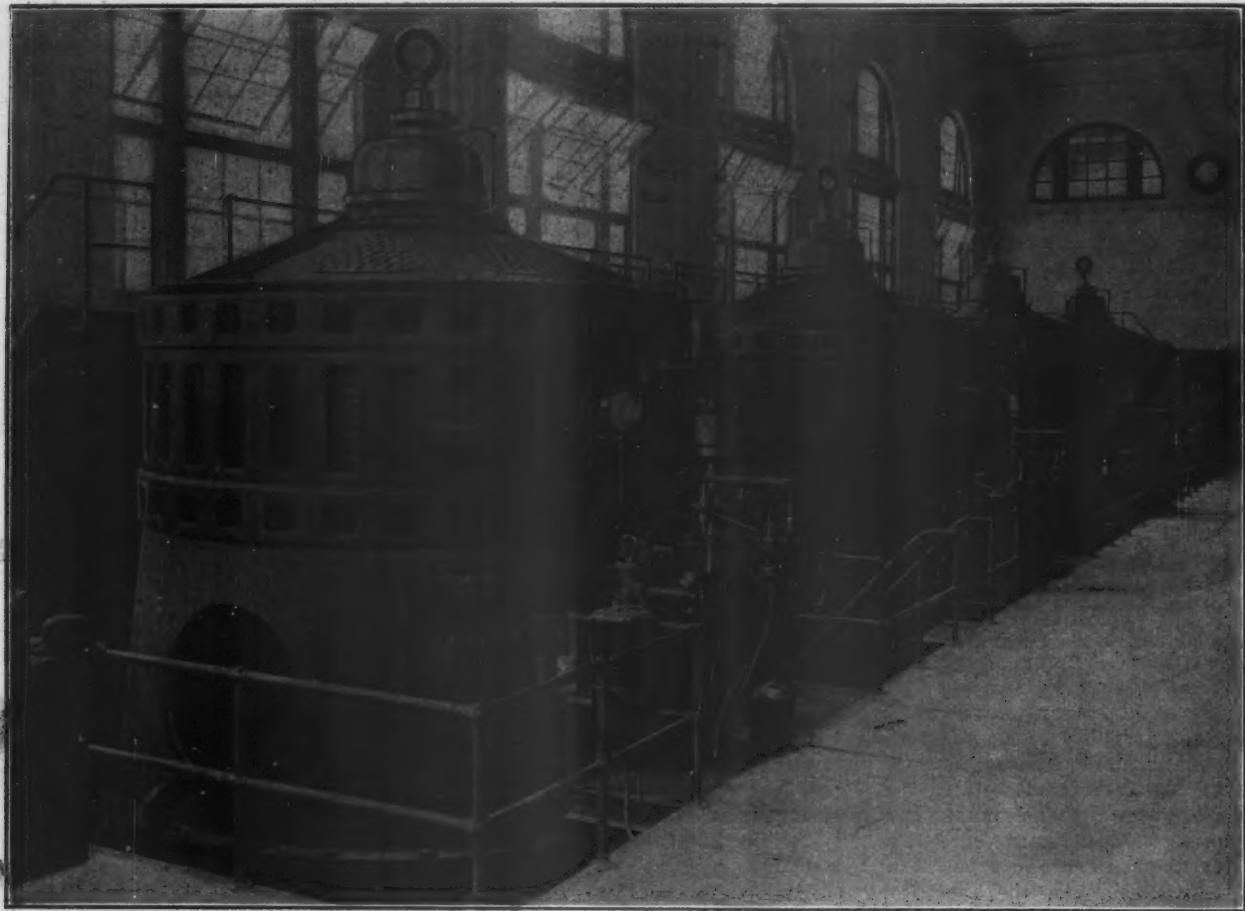


Fig. 1.—The Four 5000-Hp. Pelton-Francis Turbines and Direct Connected General Electric Alternators in the Schaghticoke Plant of the Schenectady Power Company.

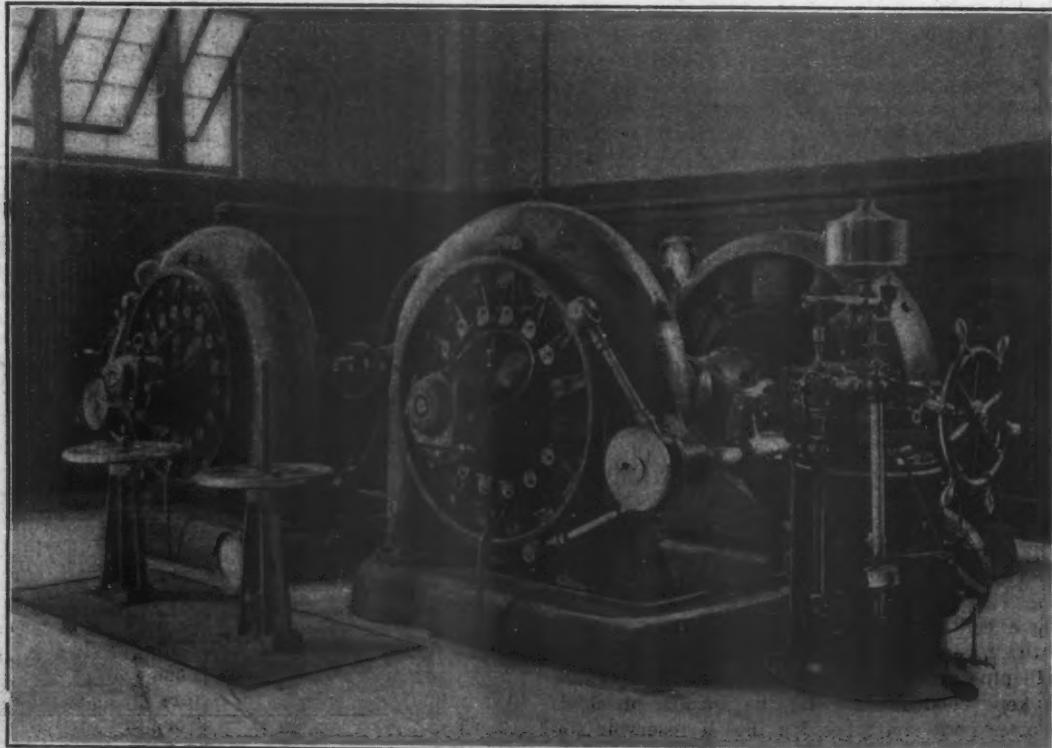


Fig. 2.—The Horizontal Shaft Pelton-Francis Turbines and General Electric Direct Current Generators Forming the Two Exciter Units.

pany; New York City, has been made for the Schenectady Power Company in its hydro-electric plant at Schaghticoke, N. Y. The system, which is operated in

made for storing water. More concerning this will be given later following a description of the installation at the Schaghticoke plant.

Fig. 1 shows a view of the four 5000-hp. vertical shaft turbines at Schaghticoke. Each of these is directly connected to a vertical shaft alternator directly above of 3000-kw. capacity at 300 rev. per min., when the turbines are supplied with water under a head of 146 ft. The generators and all of the rest of the electrical equipment of any magnitude was furnished by the General Electric Company, Schenectady, N. Y., which is one of the consumers of the power generated. Fig. 2 shows the exciter units for the alternators, of which there are two, each driven by a Pelton-Francis horizontal shaft turbine directly connected to a 150-kw., 600 rev. per min., 250-volt direct current generator. With the exception that these turbines are mounted on horizontal shafts, they are the same in principle of construction and operation as the vertical turbines.

Fig. 3 shows a horizontal and vertical section of one of the vertical turbine units. These turbines are of the inward and downward flow reaction type, and consist of three main parts, the revolving element, stationary blades or vanes mounted in the turbine casing, and the controlling apparatus. The stationary blades form a ring around the moving blades and are separately mounted on shafts, each one of which is mechanically connected to the governor. By altering the angle of the stationary blades through which the water first passes, the volume of water admitted to the moving blades is varied; thus a practically constant speed is maintained automatically under fluctuating water pressures, as the governor is quick to respond to the slightest variation in speed. The governors are oil actuated, of Pelton type, each rated at 1500 ft.-lb. Oil for the governors is taken from two storage tanks provided with air cushions in which a hydrostatic pressure of 150 lb. per square inch is maintained by a reciprocating pump driven by a 12½-hp. direct current motor. Current for this motor and all of the other direct current required for power, including that for a 20-ton Alliance crane, is furnished from the exciters. The alternating current for the lighting is taken from the main current supply.

To synchronize the alternators and divide the load properly between them when they are operated in parallel each governor has a direct current motor for varying the fulcrum of the lever of the centrifugal mechanism which determines the speed at which the oil valves will be opened or closed. The governor motors are controlled from the switchboard gallery in the generator room. The governor mechanism can be adjusted by hand when desired. The oil under pressure is admitted to one end or the other of a cylinder, and the position of the piston in this cylinder regulates the opening of the gates, admitting water to the turbine runners. A duplicate pumping outfit for the governors is held in reserve for emergencies.

The lubrication of the turbines is one of the particularly interesting features. An oil lubricated roller bearing is provided at the top and two guide bearings along the 11-in. shaft. The oil for these bearings is circulated by a small gear pump mounted on the lower steady bearing immediately above the turbine case. The pump is driven by a round belt from the turbine shaft at a speed of about 600 rev. per min. The discharge from this pump flows into the case containing the roller bearing, which case is mounted on top of the generator, and the discharge from this lubricates the upper steady bearing, which is located under the roller bearing case and immediately above the revolving element of the generator. Part of the oil flows from this steady bearing into a small pipe, discharging a continuous stream of oil on the vertical spindle of the governor, flowing thence down this spindle and through pipe connections to the rock shaft bearings, which are kept flooded with oil; the surplus oil flows from the lower rock shaft bearing into a reservoir immediately above the turbine case, from whence it is again pumped. The balance of the oil from the upper steady bearing lubricates the lower bearing, flowing thence into the reservoir above referred to.

In a test recently made on these turbines the efficiency at half load was found to be 80.3 per cent., at three-quarters load 85.335 per cent., and at full load 82.95 per cent. Even at one-quarter load an efficiency

of approximately 67½ per cent. was obtained. The remarkably high efficiency of these turbines between half and maximum full load is particularly creditable.

The power house is a brick and steel building, with concrete foundations, floors and wheel pits, and is roofed with tiled brick. The water is received through penstocks beneath the floor leading directly to the wheel pits and is discharged through flaring draft tubes to the tail race. It is possible to obtain the head of approximately 150 ft. by going back on the line of the river about 2 miles. As the river winds the direct line to the dam from the power house is only a trifle over

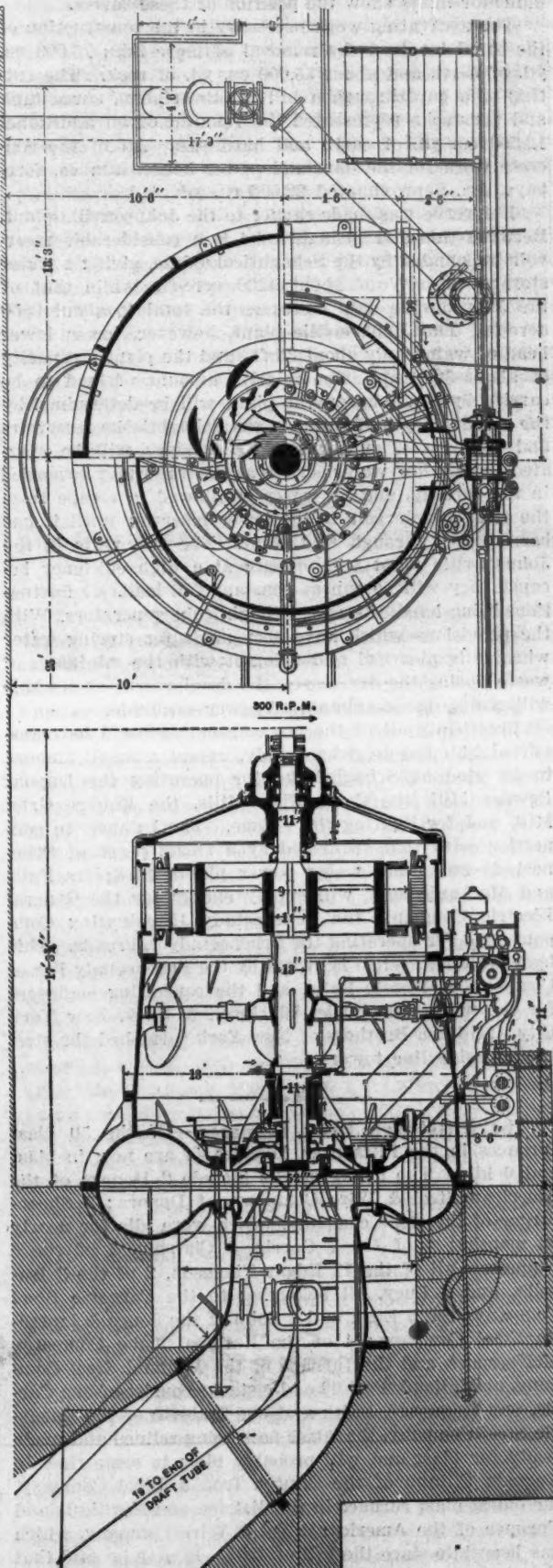


Fig. 3.—Horizontal and Vertical Sections of One of the 5000-Hp. Vertical Shaft Hydro-Electric Generators.

$\frac{1}{4}$ mile. From the dam the water is taken by a canal which widens out into a reservoir, and from the outlet of the latter the water is conveyed through a $12\frac{1}{2}$ ft. in diameter inverted siphon about 900 ft. long to a surge tank 56 ft. high and 40 ft. in diameter. In the latter the water is permitted to rise without overflowing in case of an excess pressure at the turbines by a too rapid closing of the gates. Four 6-ft. penstocks lead from the surge tank, one to each of the 5000-hp. turbines, and a fifth, 2 ft. in diameter, leads to the exciter units. The four large penstocks are provided with motor operated valves controlled from the power house, and indicator lights show the position of these valves.

The excavating work necessary in the construction of the canal involved the removal of more than 75,000 cu. yd. of earth and about 55,000 cu. yd. of rock. The cutting of a gap through a hill for the siphon, surge tank and penstocks represented the removal of an additional 12,500 cu. yd. of earth and hard pan. All of the concrete work for the dam and power house, intakes, forebays, &c., approximated 22,000 cu. yd.

Reference was made earlier to the Johnsonville plant. Between this and Schaghticoke is a considerable reservoir impounded by the Schaghticoke dam, giving a water storage capacity of about 1230 acre-ft., while that of the Johnsonville dam increases the total to about 9850 acre-ft. The Johnsonville plant, however, has a lower head of water, only about 35 ft., and the plant a capacity of about 5000 hp. The relative amount of load to be carried by the Johnsonville plant will be determined by the relative depth of water in the Schaghticoke reservoirs and forebay. The Johnsonville turbines will be operated during low water periods as the water may be needed in the forebay, and no water is allowed to escape from the storage reservoir to the lower reservoir until it has been passed through this plant. The two units in the Johnsonville plant will operate at a high efficiency because they will be run at constant full load, all fluctuations being handled by the Schaghticoke generators. With the provisions which have been made for storing water when it is plentiful and using it with the minimum of waste during the dry season the development as a whole will realize the maximum of power available.

Practically all of the power generated will be transmitted 21 miles to Schenectady, except a small amount to be used at Schaghticoke for operating the Dupont Powder Mill, the Cable Flax Mills, the Empire Grist Mill, and for lighting the village. The balance, in connection with that furnished by a steam plant at Schenectady and other water power plants at Spiers Falls and Mechanicsville, will supply energy for the General Electric Company, the Schenectady Illuminating Company, and for operating the Schenectady railroads. This hydro-electric system is owned by the Schenectady Power Company of Hoosic Falls, and the consulting engineers for the work were Viele, Blackwell & Buck, New York City. Milliken Brothers of New York furnished the steel transmission line towers.

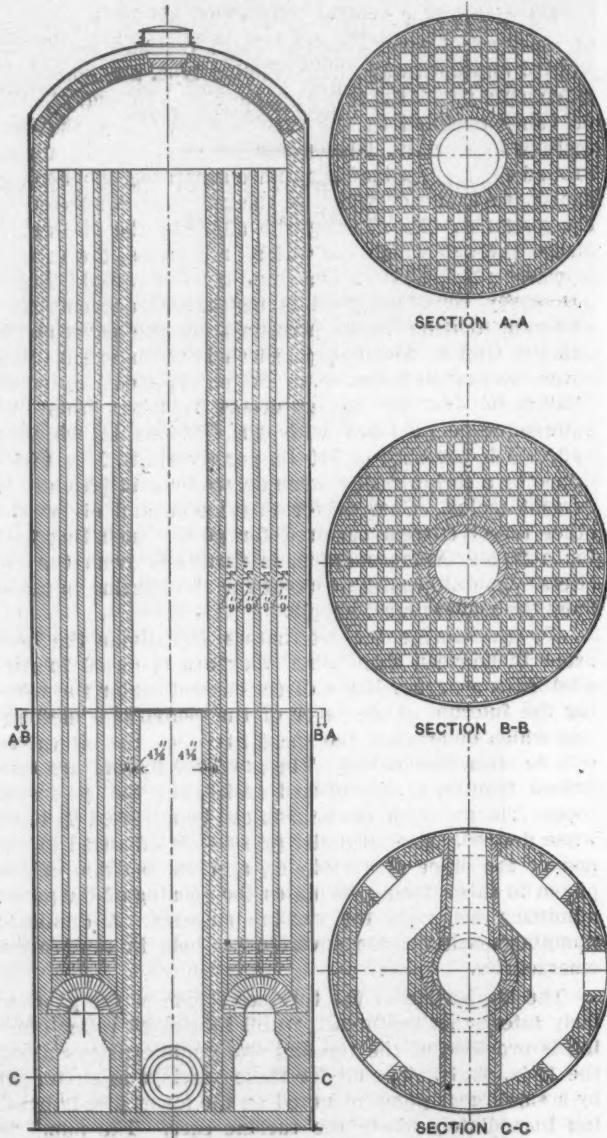
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The Pittsburgh Blast Furnaces.—Of the 50 blast furnaces in the Pittsburgh District 44 are now in blast and 6 idle. The active stacks include 2 Donora of the American Steel & Wire Company, at Donora; 2 Shoenberger of the same company, which were idle for nearly 18 months; 6 of the 7 Carrie, 3 Clairton, 5 of the 6 Duquesne, all of the 11 Edgar Thomson, 2 of the 3 Isabella, and 2 Lucy, all belonging to the Carnegie Steel Company; the 5 Eliza and 1 Soho of the Jones & Laughlin Steel Company; 4 of the National Tube Company, McKeesport, and the furnace of the Midland Steel Company, at Midland, Pa. The idle stacks consist of one Carrie, one Duquesne, Edith and one Isabella of the Carnegie Steel Company, the latter now being relined and made ready for blast and will probably blow in some time in August; Clinton of the Clinton Iron & Steel Company, the oldest blast furnace in the district, and Neville Island Furnace of the American Steel & Wire Company, which has been idle since the fall of 1907. It may be said that the pig iron output in the Pittsburgh District is almost normal again.

The Nelson Hot Blast Stove.

A hot blast stove of exceptionally simple and strong construction has recently been patented by A. C. Nelson of Cleveland, Ohio. As shown in the illustration, the stove has a circular wall surrounding the central combustion chamber, a circular wall close to the shell of the stove and 9-in. square checkers filling the space between these walls. All the above are laid with standard 9 x $4\frac{1}{2}$ x $2\frac{1}{2}$ in. brick, with the exception of the lining of the combustion chamber, which includes standard 9-in. keys, and its false wall composed of standard 9-in. circles.

The simplicity of the construction is plainly evident in the horizontal cross sections A A and B B of alternate



Vertical and Horizontal Sections of the Nelson Hot Blast Stove.

courses. Each brick is absolutely bonded with the adjacent bricks without a break, making it practically impossible for any part to become deranged and giving the greatest strength and solidity to the structure. As this construction is continuous throughout the checker work, but very few bricks could fall out of place even if the arches supporting the checkers were destroyed by long service.

The arches are built semicircular in form, of standard 9-in. shapes, and in a way to give the greatest strength. This method carries the loads directly to the supporting walls with a minimum of lateral thrust and eliminates the use of any of the flat tile which have been found so disappointing in many recent stoves. The only bricks used in the construction which are not standard 9-in. or which exceed the 9-in. equivalent (consequently classed as "specials") are the $13\frac{1}{2}$ x 5 x $4\frac{1}{2}$ in. tile brick directly over the arches for supporting the checkers and

the dome plug. These form less than one-quarter of 1 per cent. of the total brick in the stove. The use of this small percentage of specials makes it possible to manufacture each brick much more accurately and lay the entire mass better than is possible where many different shapes must be fitted together. The amount of clay is consequently cut down, thick end or side joints are eliminated, and all the bricks are laid on thin natural beds with no tendency to rock or tip over.

The amount of heating surface compares very favorably with other stoves now in use, and in some sizes gives a greater area. It is not compulsory to have the openings at the bottom of the stove located as shown by the accompanying illustration. This type of lining can be adapted to any two-pass stove, regardless of the location of its openings and whether it has formerly been lined with a side or a central combustion chamber.

Two of these stoves are now in satisfactory operation and five others are under construction. Arthur G. McKee, Rockefeller Building, Cleveland, Ohio, is associated with Mr. Nelson in introducing this stove.

The Dominion's Naval Policy May Provide for Shipbuilding.

TORONTO, July 9, 1909.—A question that has been brought into prominence in this country within recent months is that of naval defense. The excitement created in the United Kingdom by the discovery that Germany was accelerating the construction of great battleships called for by her naval programme spread throughout the Empire. In Canada opinion was all but unanimous that the burden of the naval defense of the Empire should no longer be left wholly on the shoulders of the mother country. A resolution passed by the House of Commons declared it to be the sense of the members that Canada should take some measures for the defense of her coasts, and, in so far as is consistent with her autonomy, should assume her part of the responsibility for naval defense. An Imperial Conference is to be held in London this month to discuss the business of co-operating in the matter of the Empire's sea power. Two members of the Laurier Cabinet have been selected to attend that conference.

All this has had the effect of giving a new and vigorous impulse to the agitation for the adoption of a national policy to promote shipbuilding. For years this question has been kept before the Government. Memorials have been presented from ports in the Maritime Provinces, on the Great Lakes and on the Pacific Coast, urging the Government to grant a bounty, generally put at \$6 a ton, to encourage shipbuilding. These petitions have failed to persuade the Government. It is not improbable, however, that what the Government could not be induced to do by representations on behalf of industry and transportation it may be moved to do in response to a call to make preparations for defense. If craft suitable for coast defense purposes are to be put afloat by the Canadian Government, yards for building them will sooner or later be made ready for operations on Canada's sea coast. In order to provide such yards with work enough to keep them busy something more than Government orders for torpedo boats, submarine craft and light cruisers will be required. Such yards must be enabled to compete for the orders of steamship lines requiring vessels in the service of Canada's merchant marine.

In his speech supporting the resolution for branching out along a line of naval defense, Mr. Foster, ex-Minister of Finance, spoke of the reflex action of such a policy upon the shipbuilding and steel industries of Canada. Since then influential newspapers on both sides of politics have strongly advocated the fostering of shipbuilding by Government aid. The *Toronto Mail and Empire*, the principal organ of the Conservative party, took the lead in the enforcement of the idea that the proper way to initiate a system of truly domestic naval policy is to develop a shipbuilding industry and thus stimulate the expansion of the country's merchant marine. A merchant marine, it pointed out, has usually been the precursor of a naval establishment, fighting ships being

brought into existence as the protectors of merchant vessels. The opportunity for pressing the claims of the shipbuilding industry upon the attention of the Government is seized by that portion of the press that has generally been most cordial in its support of measures for promoting the growth of the iron and steel industry. Thus the *Halifax Chronicle*, a Government newspaper, and the *Halifax Herald*, an opposition newspaper, are alike enthusiastic for taking advantage of the present favorable moment to forward the interests of a shipbuilding industry. The *Chronicle* remarks that the critical stage in the evolution of Canada's steel industry has been successfully passed and that the time has come for adding the next stage in the series of developments along that line—namely, the launching out of enterprise into the building of steel vessels. The *Chronicle*'s unreserved advocacy of a national shipbuilding policy at the present time has probably special significance. The paper is close to the Government. The Finance Minister was its former editor, and the question of a shipbuilding bounty pertains to his department.

A policy for developing the shipbuilding industry might be considered to involve, along with a tonnage subsidy, the granting of aid to steel plants for the establishing and tentative operating of plants for the manufacture of structural forms, plates, &c., required in naval architecture. It is not impossible that there may be a transition from bounties on pig iron and steel ingots to bounties on such steel products as the framework of ships. It has been stated in a very meaningful way that when the details of the naval policy the Government has decided upon are made known they will be found to be of a broadly Canadian character.

C. A. C. J.

The Steam Turbine Industry Assuming Large Proportions.

The Allis-Chalmers Company, Milwaukee, Wis., furnishes information regarding its business, which shows the large proportions attained by the steam turbine industry. This company has been shipping out a large number to fill recent contracts, among them being machines of 500 to 3500 kw. capacity for the British Electric Light & Power Company, Galveston, Texas; Oak Park Power Company, Flint, Mich.; Savannah Electric Company, Savannah, Ga.; Florida Mining Company, Mulberry, Fla.; Glenlyon Dye Works, Phillipsdale, R. I.; Willamette Valley Company, Springfield, Ore.; Pacific Mills, Lawrence, Mass.; Cia Electrica y de Ferrocarriles de Chihuahua, Chihuahua, Mex., and Oshkosh Gas Light Company, Oshkosh, Wis.

Orders now in drafting room or shop comprise units as follows: Western United Gas & Electric Company, Aurora, Ill., 1000 kw.; Neenah Paper Company, Neenah, Wis., 1000 kw.; Cleveland Cliffs Iron Mining Company, Ishpeming, Mich., 2000 kw.; Royal Weaving Company, Pawtucket, R. I., 1500 kw.; North Adams Gas Light Company, North Adams, Mass., 1000 kw.; Merchants Heat & Light Company, Indianapolis, Ind., 2000 kw.; Northwestern Gas & Electric Company, Walla Walla, Wash., 1000 kw.; Wilkes-Barre Gas & Electric Company, Wilkes-Barre, Pa., 1500 kw.; Eastern Pennsylvania Railway Company, Pottsville, Pa., 1000 kw.; Delaware, Lackawanna & Western Railroad Company, Scranton, Pa., 2000 kw.; Colorado Springs Electric Company, Colorado Springs, Colo., 1500 kw.; Great Southern Lumber Company, Bogalusa, La., 1000 kw. A considerable number is also in hand comprising units of under 1000 kw.

The Williams Gauge Company, Pittsburgh, recently shipped to the Hawaii Sugar Refining Company, Honolulu, Hawaii, a steam trap that is believed to be the largest ever built. It is of the steam operated type, and has a 4-in. inlet and outlet. The weight of the trap alone is 735 lb. At each operation it discharges 416 gal. of water. This trap is to be operated in connection with sugar kettles, and will operate at a pressure of 150 lb. The refinery is operated by Alexander & Baldwin, who are now using 24 of the Williams steam traps.

THE IRON AGE

Established in 1855.

New York, Thursday, July 15, 1909.

Entered at the New York Post Office, as Second Class Mail Matter.

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		EDITORS.
		HARDWARE EDITOR.

The Copper Situation.

The Copper Producers' Association, under the management of L. C. Graton, has added greatly to the value of the monthly returns which it publishes by showing separately the deliveries for export and for home consumption. For the first six months of the current year the statistics are:

	For domestic consumption.	For export.	Total.
	Pounds.	Pounds.	Pounds.
January	51,862,624	38,499,797	90,362,421
February	43,578,118	30,968,496	74,546,614
March	48,871,964	59,191,043	108,063,007
April	47,546,010	65,110,111	112,656,121
May	61,163,325	70,542,753	131,706,078
June	60,591,116	70,986,457	131,557,573
Totals	313,613,157	335,278,657	648,891,814

These figures are decidedly encouraging so far as they reveal an expansion in domestic consumption which is in line with the well authenticated developments in other branches of the metal and iron trades.

The statistics of production include all the marketable copper made at the refineries of this country from domestic mines and from ores, concentrates, matte and blister imported from foreign countries, notably Mexico and Canada. With the exception of the relatively small quantity of refined copper imported into this country in that form, the bulk of the imports therefrom figure in the total of the marketable copper. It includes, therefore, the concentrates of the Nacozari mines, the product of the Greene, on the Mexican border, the Granby and others in British Columbia, and the Cerro de Pasco of Peru. Since the beginning of the year the production and the monthly increases and decreases in stocks have been as follows:

Month.	Production.	Stocks.
	Pounds.	Pounds.
January	112,185,200	+ 21,772,779
February	103,700,817	+ 29,154,203
March	117,058,661	+ 8,995,654
April	113,574,292	+ 918,171
May	118,356,146	- 13,849,932
June	116,567,493	- 14,000,082
Totals	681,302,609	+ 32,500,795

The year opened with stocks of 122,357,206 lb. of copper, and stood at 154,858,061 lb. on July 1. The features of the year thus far are an enormous production and expanding domestic requirements, which, however, are unable to cope with it, thus forcing the exportation of a very large surplus upon the European markets, which do not absorb the extra quantities thus thrust upon them.

There seems very little hope that production will de-

cline, either in this country, Canada and Mexico or in other countries which do not ship to our refiners. There is not one serious cry of distress from any quarter. On the contrary, new mines are steadily coming in. There is not the remotest chance of any co-operation to restrict production on the part of the great mines. The experience of some of them in "holding the umbrella" is too recent to encourage further experiments in that direction.

While the statistical position is clearly defined in this country, it is a very different matter abroad, and it is very much to be desired that copper producers in other countries organize some system similar to that of our own. We have very little confidence in the data relative to the visible supplies in Europe. There is a general suspicion that stocks there, chiefly in bankers' hands, must be enormous, while consumption continues below the normal. The question naturally arises whether the willingness to finance loans on copper may not possibly reach a limit, and the time may not come when the dumping of a large surplus every month may be stopped. Although the low level of prices is an element of strength, there is always the possibility that holders, speculators and others may be getting tired. We have seen copper prices lower even under more favorable conditions. With the world producing at a record rate and consumption running below normal, with large stocks only fairly strongly held, the trade will continue to act cautiously.

Unfortunately the copper trade is cursed with a number of groups of speculators who gamble simultaneously in shares and in the metal proper. Some of them have control of great producing properties, whose commercial policy is shaped by the position of directors in the speculative markets rather than by the best interests of the stockholders and the trade at large. At times the consuming industries are at the mercy of these speculators, some of whom have conducted operations which defied the ordinary laws of trade. To those who are identified with the consuming industries there is little satisfaction in the fact that they have sometimes been severely punished. In spite of such experiences the legitimate copper trade is only too often the tail of the gamblers' kite.

A Great Crop Outlook.

Never has the general crop outlook been better than is now promised by the Government report made public last week. On the basis of the acreage planted for this season and the condition shown July 1, the production of cereals is estimated as follows: Wheat, winter and spring combined, 693,000,000 bushels; corn, 3,117,000,000 bushels; oats, 1,030,000,000 bushels; barley, 191,000,000 bushels; rye, 31,500,000 bushels; total, 5,062,500,000 bushels. This compares with a total of 4,339,016,000 bushels actually harvested last year. Corn and oats make the best July showing on record. The largest crop of corn ever raised was that of 1906, when 2,927,418,091 bushels were garnered. That was also the year of largest wheat production, 735,280,970 bushels. The total of all grains that year surpassed all previous records, being 4,839,000,000 bushels. The estimated total for this year is 223,000,000 bushels in excess of that of 1906, so that considerable deterioration could take place between now and harvest time and still enable the greatest crops ever known to be secured.

Nature has thus far greatly favored agricultural interests this year. Doleful predictions regarding winter wheat were made last autumn and through the winter and spring, the fear of a short crop being general. But

the result of the harvest of this crop, which is now nearly completed, has been surprisingly good, ranking with the four best years since 1900 and running well ahead of the figures of last year. This shows, as had often been demonstrated previously, that too much credence should not be given to reports of deterioration during the growing period. Estimates of condition are too often colored by the interests of the growers, who naturally wish to maintain prices by overstating local damage. We shall probably hear much this year of unfavorable weather, insect ravages, &c., to offset the brilliant expectations of a most bountiful crop, which are so gratifying to everybody but those who desire very high prices on all farm products. Yet, while there may be some decline in these prices if the crop should approximate the figures which have been given out, it seems reasonably certain that even then the financial results will be highly satisfactory to the growers. Stocks of cereals are low everywhere. Consumers all over the world have the lightest supplies in years, due to the fact that for several seasons in succession the yield of cereals has been below the average, causing the surplus stocks of all countries to be practically exhausted. With a market bare of supplies it will take more than one year of bountiful crops to make a serious impression on prices.

What this means to the general business interests of the country can easily be described. The railroads of the great cereal growing sections will be assured of a traffic that will again tax their facilities. The people of these sections will enjoy another season of rampant prosperity, which will make them liberal buyers of all kinds of manufactured products. In every branch of commercial and manufacturing enterprise the quickening effect of such an important impulse to the nation's activities must be sharply felt. Let us fervently hope that no untoward manifestation of nature's occasional lapses from natural weather may blight this most pleasing prospect.

The Distribution of Pay Envelopes in Factories.

In certain localities the practice is gaining ground of distributing pay envelopes through the works, each employee being handed his week's earnings by clerks who make the rounds of the shops on pay day. The change to this system is largely on the theory that to stand in line to receive wages detracts from a man's self-respect. It hurts the pride of many workmen still further to have their names on pay envelopes replaced by numbers, which is the usual method at a pay window. The elimination of the pay window further effects some saving of time, either of the workmen after they have finished their labors or of the employer if the line is permitted to form in shop hours. In very large plants such a system may not be practicable, nor would it be in certain smaller works because of the nature of the employment. But in most small establishments, and in many of considerable size, there appears to be no serious obstacle to the use of such a pay system. The services of one or more clerks are needed for only a short time. The payment is a personal, private transaction, which appeals strongly to the American idea. Surely, no harm can result from giving to a man's wages an additional dignity, and, though it may seem a small matter, where the change has been made from the line at the window to the unostentatious handing of the envelope to the man during his work, the comment of the shop is of the sort that would surprise the employer who has never given heed to the question.

One of the underlying conditions breeding labor troubles is the feeling of working forces that they con-

stitute a class entirely apart from the management. Modern business methods have compelled the abandonment of the old relations between employer and employed. Before the days of great undertakings the owner knew every man in his plant and a feeling of equality existed. In reality no change has been wrought in this respect, so far as the feelings of owners toward their loyal workmen are concerned, even in large establishments, but the opportunity of giving expression to their friendliness by personal contact no longer exists. Their relations with their men must be through others. Even in the small factory the rush of modern production precludes other than brief business contact, and, of course, personal association rarely extends beyond the shop door. Every step in the development of successful management must be accompanied by system, and the atmosphere of the industrial system must always appear a cold one. If in any way, such as by the method of distributing wages, the workmen are made to feel a narrowing of the gap between them and the office the results cannot be otherwise than beneficial.

The "Funnelless Ship" Not Arrived.

Frequently published declarations that the problem of the "funnelless ship" has been solved for liners and battleships were refuted at the recent meeting of the British Institution of Naval Architects. While confidence was expressed as to the future of the internal combustion engine in very large units for marine purposes, the consensus of opinion was that the development of both the gas and the oil engine must go along gradually through successive steps of size of unit.

A paper by H. C. Anstey, which opened the discussion, contained important data regarding the relative weight per horsepower of steam and combustion engines. Assuming that the weight of an engine is proportional to the maximum pressure for which it is designed, he finds that the horsepower per ton of a steam engine is 3.2 times that of a combustion engine of the same linear dimensions. Certain corrections bring this ratio down to perhaps 2 to 1, which, however, leaves out of account the weight of boilers and their accessories. Touching the latter, Mr. Anstey said:

These will have a counterpart in the gas producers for the gas engine, but have no equivalent in the oil engine. So far as the gas engine is concerned, the weight and space required for producers are largely dependent upon the type of fuel used and the cleaning arrangements necessary to deal with the gas. As the weight of boilers is about equal to the weight of engines, it follows from the above conclusion that the horsepower per ton will, for the complete installation, be about equal to that of an oil engine of the same linear dimensions as the steam engine. It is possible that there may be some saving, such as has sometimes been imagined by inference from the results obtained with small sized units, where the speed of revolution is high.

The author had previously stated that some very remarkable results have been obtained with small petrol engines in respect to power developed on a given weight, but, he says, it is to be remembered that this extreme lightness is due principally to two causes—a high speed of revolution and the use of special materials of construction. No part of the extreme lightness is due directly to the engine being of the explosive type.

In order to keep down the weight of the combustion engine in installations of large power the number of cylinders must be increased. The speed of revolution must also be kept high, and this can only be accomplished by maintaining small diameter cylinders, for, with a given piston speed, the speed of revolution varies inversely as the diameter. How far the number of cylinders

ders can be increased advisedly can only be determined by experience. Up to the present 16 cylinders have been used on one shaft, said Mr. Anstey, and there seems no reason why this number should not be increased by successive steps of four or more cylinders at each step. He says:

The powers, however, which have been obtained per cylinder in engines whose design permits of application to propulsion are not large, probably not exceeding 100 hp., and until the unit is largely increased the very large powers required in many present day vessels are out of reach of the internal combustion engine, the immediate application of which would appear to be concerned mainly in the propulsion of boats and small vessels.

In dealing with the proposition to transmit power from the engines to the propeller electrically, the paper states that commercially it does not afford sufficient advantage for mercantile work, while for naval work it cannot compete with existing steam machinery in the all-important considerations of weight and space.

The general opinion as to the present possibilities of the combustion engine for marine purposes is reflected in observations by *The Engineer* of London, which says:

In the matter of space there is no doubt some advantage, but it is doubtful if full allowance has been made for the numerous accessories and auxiliaries which form part of every ship and are dependent in the steamer on the main boilers. Take, for example, such things as pumps—other than feed—fresh water evaporators, steering gear, winches, refrigerating machinery and so on. Each of these now draws its supply of steam from the main generators. How are they to be worked in a gas or oil engine ship? Evaporators might use the exhaust from the engines, but what of the steering gear and refrigerating machinery? They must have their own boiler plant, or they must be driven in some other way, say electrically; but in either case it is doubtful if they can be run with so little weight per cent. of power as under the present circumstances. Then as to those chimneys? Is it forgotten that the gas engine has products of combustion that must be got rid of, and if they are to be disposed of noiselessly they must leave at a low velocity? In other words, that a big funnel will be required. It is said that they will be discharged below the water level. That may do for small powers. We doubt if it would be found practicable in a liner or a battleship.

Undoubtedly such minor problems as these will be worked out successfully whenever the development of the combustion engine reaches the point of displacing the steam engine in large vessels. But evidently the time is not yet at hand for the elimination of the funnel.

No better indication of improved business conditions could be given than the reported scarcity of labor in the coke regions of western Pennsylvania. This is a somewhat sudden development. Until quite recently the depression in the coke trade was acute. The production was much in excess of the consumption, and very low prices were made to move accumulating stocks at the ovens. If the scarcity of labor is now so pronounced as advises state, consumption has at last caught up with the current output, and the foreign coke workers who returned to Europe during the panic are again needed.

Rail Sections Compared in Detail.—An interesting comparison, in detail, of the latest rail sections adopted by the American Railway Association and various railroad systems is afforded in the tabular compilation of weights, types, dimensions, &c., prepared by Robert W. Hunt & Co., engineers, inspectors of rails, &c., The Rookery, Chicago. Reference to a lettered drawing of a rail cross section accompanying this table facilitates the location of the various parts to which the figures apply.

The Riverside Engine Company, Oil City, Pa., is building a 1500-hp. gas engine for the Ford Motor Car Company, Detroit, Mich. It has also made a large installation in the ice plant of the Baltimore Plate Ice Company, Baltimore, Md., consisting of a large gas engine direct connected to an ammonia compressor.

CORRESPONDENCE.

Unctuous Acheson Graphite.

To the Editor: In *The Iron Age* of February 25, 1909, under the headline "Unctuous Acheson Graphite," you printed a short article which read in part as follows:

It is well known that when used as a lubricant graphite should be of such quality as to give a smooth veneer or coating to the parts to be lubricated. One of the most essential qualities is purity, for where an impure graphite is used as a lubricant it carries into the machinery dangerous friction creating materials, the impurities of natural graphite being talc, mica, clay and sand.

To be a first-class lubricant a graphite should be amorphous, very fine, soft and unctuous. It should not have brightness or luster, as brilliancy in graphite denotes ability to reflect light, and a graphite that reflects light indicates that its particles are of some measurable size and of a compact, homogeneous nature, a condition in sharp contrast to the fine, soft, unctuous qualities that assure the graphite of possessing superior merit as a lubricant. Brightness or blackness in graphite is no indication of its purity or value.

We have observed that this very accurate mention has led to your receiving at least two communications on the subject of graphite for lubrication. Inasmuch as we are the only makers of graphite in the world, it may be understood that your other correspondents are dealers in natural or mined graphite. All Acheson graphite is made in the electric furnace. All other graphite is mined. In our method we control every ounce of raw material that enters our furnaces, and we control the furnaces during the entire time period of their operation. We make many grades of graphite and esteem each as the best of its class, because through the thorough control of our material and the process we impart to graphite those qualities essential to its successful use in the field to which the various grades are applied. Surrounded by these most unusual creative conditions, it is easy to understand that we should be expected to make graphite superior to that developed by nature in the hit-and-miss accidental process she unknowingly applied.

The particular reference made in your article of February 25 last had to do with our unctuous, pure Acheson graphite. Webster defines "unctuousness" as "the state or quality of being unctuous, or of resembling oil; fatness; oiliness." From the above definition, it is evident that the condition of being smooth, polished or glassy does not necessarily constitute unctuousness. A film of oil or fat is unctuous owing to its ability to move under pressure among its own particles. This property is one of the most important characteristics of a lubricating body and only so far as the body is capable of this interior movement of its own particles is it a true lubricant. We may admit that all forms of graphite have a degree of unctuousness, but in varying amounts. Slippiness, however, is not unctuousness. Ice is slippery, but not unctuous. Thus, hard, tough flakes of graphite may slip on each other when not impaled on metal points, as do chunks of ice, and still, when used as a lubricant, wholly fail to afford the service required of a graphite that is thoroughly unctuous. Unctuous Acheson graphite, being largely composed of pseudomorphs of decomposed carbides, is unquestionably above all known forms of graphite capable of a movement within its own molecules and is, to that extent, a true lubricant incomparably superior to any natural graphite.

When we consider the problem of lubrication we should always bear in mind the fact that the surfaces of the metals composing even the highest finished bearings, when examined with a magnifying glass, are found to be quite irregular, presenting microscopic cavities and projections. If the graphite be a natural one, in crystalline or compressed flake form, it is conceivable that these more or less hard and tough flakes may become impaled on the microscopic points. In fact, we plainly see the surprising claim made that flake graphite performs its service of lubrication through the fact that it does become so impaled. If impaled, is it not evident that the metal points must have penetrated or pierced the flake? In fancy we liken these flakes of graphite to a small boy impaled on a picket fence, his legs trying to reach the ground on one side, his hands trying to do similar service of rescue on the other side throughout the period of his sufferings and without relief. If his legs or his hands had a foundation the story might be different. Let us liken this picture to the recesses and cavities left beneath these impaled flakes of natural graphite. Then, on the other hand, let us note that if the graphite used be unctuous, pure and soft, not crystalline nor hard, it will with great ease adjust itself to the microscopic irregularities of the surface, filling up the hollows and burying the points, thereby producing a mirror-like surface of great density, quite capable of withstanding continued wear and affording the highest form of lubrication. The filling up of the hollows and the burying of the points is the climax to be sought in graphite lubrication, and beyond question the longer unctuous pure graphite is used the better will be the results.

Brightness or blackness in graphite is no indication of quality or relative purity. Brightness in a graphite is evidence of ability to reflect light and to do this requires a

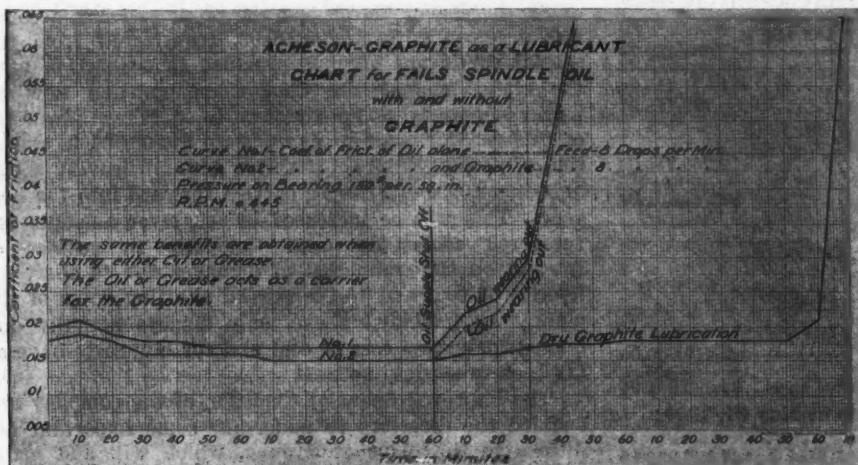
particle of some measurable size and of a compact, homogeneous nature. Hard, tough, flaky graphite is far less valuable as a lubricant than unctuous, pure, soft graphite that possesses great spreading, covering and polishing power.

The black, unctuous character of graphite makes it possible to adulterate any form of this material in such a manner as to be impossible of detection by the eye, except where the adulteration is very great. But proper laboratory tests of a simple character will detect this fraudulent practice readily, and the trade is perhaps best protected from these unfair, unscrupulous attempts by dealing with a firm of recognized standing, which is prepared to and will at all times guarantee the purity of its product. We may add that unctuous, pure Acheson graphite is always sold under a guarantee that it has a purity content of at least 90 per cent., and we esteem it as the purest and best graphite in the world.

It was only recently that Prof. Charles F. Mabery of the Case School of Applied Science, who perhaps is the highest expert authority in the United States on oils and their qualities of lubrication, wrote us as follows:

The importance of the general use of graphite in lubrication in the world-wide saving of power cannot be estimated, also its possible prolongation of the natural supply of petroleum, while from what I have seen of your processes, deflocculated graphite can be manufactured as long as carbon in any form is obtainable, leading me to consider graphite the future lubricant of the world.

Professor Mabery refers to deflocculated graphite. This may be a product wholly unknown to many of your readers.



Curve of a Test Showing How a Film of Graphite Lubricated After the Carrier Had Worn Out.

We may explain by saying that both natural and electric furnace graphite are reduced to powder form in pulverizers or similar apparatus, while deflocculated graphite is unctuous, pure Acheson graphite reduced to practically a molecular condition, the finest state of subdivision, by a process invented by our Dr. Acheson. This deflocculated graphite is rendered so fine that it remains suspended in oil or water and may be passed through the finest filter paper made. It is this remarkably fine graphite which is destined to revolutionize the art of lubrication and must be accepted as the very latest aid science has brought to mankind to assist in that part of the world's work so dependent upon lubrication. To illustrate the impressive value of unctuous pure Acheson graphite as a lubricant, we present herewith a half-tone curve plate indicating how, in a test, the film of graphite lubricated after the carrier had worn out.

In this correspondence, with that which you have previously printed, it will be your pleasure to have informed your readers of the views held by three graphite companies on the subject and value of graphite as a lubricant. We trust they will not overlook our conviction and statement that we should be expected to do more than nature did in making graphite, and in this we do not fail.

INTERNATIONAL ACHESON GRAPHITE COMPANY,
ORRIN E. DUNLAP, Secretary.

NIAGARA FALLS, N. Y., July 10, 1909.

The National Daylight Association of Cincinnati is actively pushing the work of interesting the people of other sections in the proposition to save one hour of daylight each day for the five summer months, May to October, to all the people of the United States. Literature is being distributed setting forth the arguments in favor of the proposition and including much exceedingly interesting information on the subject of the indication of time. The association maintains an office at 115 East Fourth street, Cincinnati, Ohio, to which communications can be sent.

Prevention of Accidents in a New Mexican Colliery.

At the twenty-second convention of the International Association of Accident Underwriters, Dr. William H. Tolman, director of the American Museum of Safety and Sanitation, read a paper entitled the "Perils of Peace; or, A Safer America." In it he gives the following account of the methods pursued at the collieries of the Stag Canon Fuel Company, at Dawson, N. M., owned by the Phelps-Dodge interest:

James Douglas, president of the company, informs us that a complete telephone system, with stations at the most convenient points within the mine, affords communication with every important place in the camp, and, through the central station, with Sante Fé, Albuquerque, Denver and other cities.

The mines are sprinkled by water cars to lay the coal dust, which is removed from the roadways as far as practicable, and taken out of the mine. Extra fire bosses have been recently employed at each of the mines to instruct the men in regard to timbering and to see that every precaution is taken to guard against accident from careless work by the miners.

The shooting is done by electricity after all the men are checked out of the mine. As they enter they are required to deposit a metal check at the shot firing house outside, near the entrance. These checks are placed on a checkboard and returned to the men as they come out. A record of the working place of each check number is kept in the shot firing house, and in case any check is uncalled for the shot firer makes a search for the man until he is found. No shots are fired until it is known positively that all persons are out of the mine. To insure safety against accidental discharge of the shots by

electricity, there are two or more locked switch boxes in each mine with throw off switches; one at the mouth and one or more at stations inside the mine. After inspecting the inside connections with the shots to be fired the shot firer en route from the mine makes connections at each of the switches. He then goes on to the shot firing cabin to turn on the electric current, but before doing so he turns on an electric red signal light to warn all persons away from the vicinity of the mouth of the mine, so that, should an explosion occur within, no one outside could be injured by flying débris.

The shot firing system has proved a success; the safety of the men from disastrous dust explosions, due to blown out shots, is assured, miners make better wages and the production of coal is proportionately greater per man employed. A record is kept of the number of shots fired, showing that less than 2 per cent. of shots are missed. The missed shots are left for the next day's shooting, and are either reprimed or a new hole drilled to perform the work intended for the original shot. Very little firedamp has been encountered thus far in the mines, but a supply of Wolf safety lamps is kept ready for use.

An organized first aid corps had regular practice and competitive drills during the past year, for which the company contributed appropriate prizes and medals for the most efficient team work.

A large building is being erected for a rescue station, in which the first aid corps and others may practice and exercise while wearing the helmets in a chamber filled with vitiated gases. The rescue station is designed after plans of the one in use at the mine of the Dominion Coal Company in Nova Scotia, modified to some extent.

The powder magazines at the mines, built of stone,

iron and cement, are absolutely fireproof. The heat is supplied by electric radiators, which maintain a constant temperature within the magazine; the electric stove, or radiator, and all wires are at a considerable distance from the stored powder and out of reach of anything combustible or explosive.

If casualties do occur they are immediately investigated with a view to preventing their recurrence. As far as human skill can do, they have employed every known device to make their mines safe; but, as we are living in a new era for the protection of human life, there are no doubt many devices to be created which are at present unknown.

The Dominion Iron & Steel Company, Ltd.

The report of the Dominion Iron & Steel Company, Ltd., for the year ending May 31, 1909, presents the following profit and loss account:

Net earnings from operations after deducting all expenses including current repairs and provisions for relining furnaces.....	\$2,634,127.00
Appropriation for sinking fund, exhaustion of minerals and depreciation and renewals of plant	408,292.05
	\$2,225,834.95
Interest:	
On first mortgage bonds.....	\$374,979.17
On second mortgage bonds.....	95,000.00
On loans.....	184,443.54
	654,422.71
Net profits for year.....	\$1,571,412.24
Balance brought forward from last year.....	789,178.97
Amount heretofore reserved in respect of claim against Dominion Coal Company, re-transferred from contingent account.....	2,209,210.03
	\$4,569,801.24
Less:	
Dividend on preferred stock (Nos. 5, 6 and 7).....	\$525,000.00
Special appropriation to blast furnace relining fund.....	145,000.00
Special appropriation in reduction of property account.....	1,800,000.00
	2,470,000.00
Balance carried forward as per balance sheet.....	\$2,099,801.24

Following is the balance sheet as of May 31, 1909:

Assets.	
Cost of properties.....	\$34,587,232.18
Current assets:	
Inventories	\$1,640,293.84
Accounts receivable:	
Trade accounts.....	\$1,234,204.95
Miscellaneous	516,922.85
	1,751,127.80
Cash:	
In banks and on hand.	\$175,113.78
Deposit with Governm't	50,473.23
	225,587.01
Deferred charges to operations:	
Advance work at mines and quarries, unexpired.....	
Insurance, &c.....	222,830.77
	3,617,008.65
Total.....	\$38,427,071.60
Liabilities.	
First mortgage 5 per cent. bonds:	
Total issue.....	\$8,000,000.00
Less redeemed and canceled.....	508,000.00
	7,492,000.00
Second mortgage 6 per cent. bonds:	
Total issue.....	\$2,500,000.00
Less matured and paid.....	1,000,000.00
	1,500,000.00
Cape Breton real estate bonds:	
Total issue.....	\$100,000.00
Less matured and paid.....	74,166.51
	25,833.49
Total amount of bonds outstanding.....	\$9,017,833.49
Current liabilities:	
Accounts payable.....	\$458,623.54
Bond interest accrued.....	171,083.84
	629,706.88
Total liabilities.....	\$9,647,540.37
Reserves and provisions:	
For depreciation and renewals.....	\$1,104,023.04
For relining blast furnaces.....	158,488.20
For exhaustion of minerals.....	123,888.86
For contingencies.....	293,329.89
	1,679,729.09
Capital stock:	
200,000 shares common stock.....	\$20,000,000.00
50,000 shares 7 per cent. cumulative preferred stock.....	5,000,000.00
	25,000,000.00
Profit and loss account.....	2,099,801.24
Total.....	\$38,427,071.60

NOTE.—The first mortgage bonds are payable July 1, 1929. The second mortgage bonds are payable in installments of \$250,000 each on Oct. 1 yearly. The dividend on the preferred stock has been paid to October 1, 1904.

Accompanying the financial statement are various reports. From President J. H. Plummer's report the following extracts are taken:

The interest charges for the year amounted to \$654,422.71, but of this sum about \$150,000 was interest on floating indebtedness, which would not have been incurred but for the action of the Dominion Coal Company. Without making any allowance for the recovery of this sum, the earnings show a net surplus of \$1,571,412.24. While this is a falling off from last year's figures, the directors regard the outcome of the year's business as satisfactory in view of the conditions that have prevailed.

The payment of \$2,750,000 made by the Dominion Coal Company, Ltd., on account, leaves a balance of \$1,201,092.78 still to be adjusted. Of this sum only \$392,496.11 has been taken into account in making up the books of the company to May 31, being the balance of the moneys disbursed in payment for coal in excess of the contract price, and for law costs. The need for any provision in contingent account for a possible loss on this item has therefore disappeared.

At the end of March last the profit and loss account was credited with \$2,209,210.03, transferred from the special contingent account provided in connection with the claim against the Coal Company, and now no longer necessary. The directors have taken advantage of this readjustment to appropriate \$1,800,000 in reduction of property and construction account, leaving a balance of \$2,099,801.24 to be carried forward into the new year. This will be increased by whatever amounts are recovered from the Coal Company in respect of interest on the claim and of damages due to short deliveries of coal and to the partial shutting down of the plant. As indicated above, only moneys actually disbursed for excess cost of coal and for law costs have so far been taken into account.

The improved financial condition of the company has enabled the directors to undertake some important additions to the plant at Sydney, which will add materially to its efficiency and earning power. The steel department and rolling mills are capable of producing and finishing a larger tonnage of steel than has hitherto been made, but their output has been limited by the amount of pig iron produced, which in turn has been limited by the output of coke obtainable with our present coke ovens.

After full consideration, it has been decided to erect additional coke ovens, another blast furnace, a finishing mill for the manufacture of such materials as angle bars and standard heavy sections, and some subsidiary plant. When these additions are completed, the works will be capable of producing a much larger tonnage of finished steel than at present, and the directors hope, in due time, to see a marked improvement in costs and earnings as the result. Satisfactory arrangements have been made, through the sale of a portion of the authorized issue of consolidated mortgage bonds, for the money required for the above additions.

The depression in business which marked the past financial year would have been more severely felt, both in the output and in the earnings of the company, had it not been that we were able to keep the plant in full operation by the exportation of the production in excess of home requirements. The prices obtained during the year generally showed a marked falling off as compared with previous years, but there is now a distinct improvement in home demand, and the directors look forward to better results in the year on which we have just entered.

All departments of the large plant of the Youngstown Sheet & Tube Company, at Youngstown, Ohio, including two blast furnaces and Bessemer steel works, are in full operation, with the exception of the puddling and sheet mill departments. Wage scales have not been agreed upon for these departments, and they will remain idle until a settlement is made.

Judicial Decisions of Interest to the Iron Trade.

BY A. L. H. STREET.

Conditional Sales—Description of Property.—Property covered by a memorandum of conditional sale need not be so minutely described as to differentiate it from all other property of the same kind. (Washington Supreme Court. *Wittler-Corbin Machinery Company vs. Martin*, 101 Pac. Rep. 194.)

Conditional Sales—Replevin.—Defendant in an action of replevin for the recovery of a machine sold on condition by plaintiff, title to which never passed because of default in payment, may not counterclaim for unliquidated damages because of delay in delivery and deviation from specifications of contract. (Michigan Supreme Court. *Dearing Water Tube Boiler Company vs. Thompson*, 120 N. W. Rep. 801.)

Conditional Sales—Rights of Subsequent Purchasers.—A subsequent purchaser of a cash register sold conditionally, when payments were in arrears, but the property had not been claimed by the seller, refused to pay the balance due or to deliver the property to the seller, and the latter brought a replevin action. Held that the purchaser being entitled to all the rights of the original purchaser was entitled to judgment. (Washington Supreme Court. *National Cash Register Company vs. Wapples*, 101 Pac. Rep. 227.)

Sales—Cancellation of Order.—When a merchant orders goods to be shipped at a stipulated future date and reserves the right in such order to change or cancel it, and the time within which such right shall be exercised is not fixed, it must be exercised within a reasonable time. (Kansas Supreme Court. *J. P. Bauman & Sons vs. McManus Bros.*, 101 Pac. Rep. 478.)

Employees—Injury—Liability.—A complaint for injury to an employee who fell into an unguarded hole in a basement was insufficient where it failed to aver any duty of the employer to warn plaintiff of the danger resulting in the injury. If an employee knows of a danger resulting in his injury, or by exercising ordinary care could know of it, his employer is not bound to warn him against it. (Alabama Supreme Court. *Horan vs. Gray & Dudley Hardware Company*, 48 So. Rep. 1028.)

Corporations—Issue of Stock—Validity.—Plaintiff contracted to enter the employment of a corporation for a certain yearly salary and the setting aside of stock of a stated amount, to be paid for out of the earnings of the company. Held that the contract infringed the statute which provides that no corporation shall issue stock, except for money or labor, and that all fictitious increase of stock or debt in any form is void. (Pennsylvania Supreme Court. *Gearhart vs. Standard Steel Car Company*, 72 Atl. Rep. 699.)

Employees—Injury—Unguarded Machinery.—Failure of an employer to guard machinery as required by statute is negligence. To entitle an employee to recover for injuries resulting from negligent failure of his employer to guard machinery as required by statute he is required not only to show the negligence complained of, but also that such negligence was the proximate cause of the injury sustained. While an intervening responsible agency cuts off the line of causation from the original negligence, if the intervening act is such as might reasonably have been foreseen or anticipated as the natural and probable result of the original negligence, such original negligence will, notwithstanding such intervening act, be regarded as the proximate cause of the injury. In an action for the death of a servant alleged to have been caused by neglect to guard machinery, the burden of proving such negligence is on plaintiff. (Indiana Appellate Court. *Brown vs. American Steel & Wire Company*, 88 N. E. Rep. 80.)

Mechanics' Liens—Mill Machinery.—The West Virginia statute which gives a lien to any person "who shall furnish any material or machinery for constructing any mill, manufactory, or other structure," gives a lien for machinery furnished as a necessary part of the equipment of a mill, although it is not intended to be permanently attached to the freehold; and such lien covers the price of spare rolls furnished with a tin plate mill, and shown to be an essential part of the equipment of such mill. Complainant contracted with a tin plate company to furnish machinery for the equipment of a new tin plate mill, for which it was entitled under the statute to a mechanic's lien if filed within 60 days after it ceased to furnish the machinery. The contract included a number of extra rolls to be delivered with the other machinery, which were made at about the same time; but on request of the purchaser to withhold shipment until further notice, some of them were not shipped. Held, that complainant had the right to ship them a year later without further orders, and to file its statement for a lien for the price of the entire machinery within 60 days thereafter. The filing of a claim for a mechanic's lien, which is afterward abandoned, does not estop the claimant to file another including the same indebtedness, where the second claim is filed within the time allowed by the statute. (United States Circuit Court of Appeals, Fourth Circuit. *Canton Roll & Machine Company vs. Rolling Mill Company of America*, 168 Fed. Rep. 465.)

Trademarks and Trade Names—Infringement.—The use of a similar trade name under such circumstances as to show an intention to deceive the public and thereby deprive another person of his property rights is in fraud of the rights of such person. The right to the exclusive use of words, such as "cheese cutter," as a trade name, which are merely descriptive of the goods to which they are applied, cannot be gained by prior use. The exclusive or proprietary right in words is not necessary to obtain an injunction against unfair competition in trade by the deceptive use of words as a trade name. A complaint alleging that defendant by the adoption and use of its business name, "The Anderson Cheese Cutter Company," infringes the business name of plaintiff, "The Computing Cheese Cutter Company of Anderson," that both companies are engaged in the same business in the same city, and that by the use of such name defendant wrongfully obtains a large amount of business intended for plaintiff, states a cause of action for injunction against the use of such name. (Indiana Appellate Court. *Computing Cheese Cutter Company vs. Dunn*, 88 N. E. Rep. 93.)

Patents—Infringements—Fire Escapes.—The Sharp patent, No. 835,985, for a fire escape, consisting of a stationary frame carrying a reel upon which is wound a cable by means of which a person may lower himself to the ground, the movement of the cable being controlled by brake shoes, discloses patentable invention in the manner and means of applying the brake shoes, but is only for an improvement, and the claims must be limited according to the precise means shown and described. As so construed, the patent is not infringed by the device of the Davy patent, No. 818,526. (United States Circuit Court, N. D., New York. *Sharp vs. Bellinger*, 168 Fed. Rep. 296.)

Patents—Infringements—Fire Escapes.—The right to a patent monopoly exists only by virtue of the laws of the United States and cannot be affected by State laws. A patent monopoly can only be transferred in the manner prescribed by Rev. St. 4898 (U. S. Comp. St., 1901, p. 3387)—namely, by a written instrument signed by the owner of the patent and duly recorded. A patent right cannot be sold on execution, and does not pass to a general assignee or receiver of property of the owner. The mere appointment of a receiver to take charge of, manage and control a patent does not vest in him title to the patent which will enable him to maintain a suit for its infringement in his own name, the statute giving the right to recover damages only "in the name of the party interested either as patentee, assignee or grantee." To vest the receiver with such right of action, it is essential that the court compel or cause an assignment of the patent to him in the name of the owner. (United States Circuit Court, South Carolina. *Ball vs. Coker*, 168 Fed. Rep. 304.)

Patents—Infringements—Fire Escapes.—A preliminary injunction will not be granted restraining a defendant from the manufacture and sale of an article alleged to infringe a patent, where the patentee, with knowledge that such article was being made and sold by defendant, delayed several years before bringing suit. (United States Circuit Court, E. D., Pennsylvania. *L. H. Gilmer Company vs. Geisel*, 168 Fed. Rep. 313.)

Contracts.—Where a natural gas company agreed to furnish a crucible company with gas at a specified rate, in consideration of a grant of a right of way by the crucible company, the contract being indefinite as to time, and after many years conditions changed, so that the gas company, to cover greatly increased cost of producing gas, was compelled to increase its rates to other consumers, it could terminate the contract on reasonable notice. (Pennsylvania Supreme Court. *McCullough-Dalzell Crucible Company vs. Philadelphia Company*, 72 Atl. Rep. 633.)

Selling Agencies—Contracts—Breach.—A contract between a manufacturer and a selling agent, by which the manufacturer agrees to give the agent exclusive sale of its goods in a specified locality for one year, and to bill its goods at certain discounts from its price-list, and the agent agrees to sell exclusively the manufacturer's goods and to push their sale during the term of the contract, is not void for want of mutuality. The violation by a manufacturer of a valid contract with a selling agent renders the manufacturer liable in damages. Where the breach of a contract with a partnership occurs prior to the dissolution of the partnership such dissolution cannot be urged as a defense in an action for the breach, even if such dissolution terminated the contract. Where both partners are liable on a contract, the dissolution of the firm will not terminate the contract. Where the measure of damages for the breach of a contract is the amount of profits to which plaintiffs would be entitled, it is immaterial whether they sue for damages or for an accounting of profits. A contract by defendant to give plaintiff the exclusive sale in a certain locality of its "residence furnaces, furnace fittings and laundry dryers," in consideration of plaintiff's agreeing to sell exclusively the goods manufactured by defendant, is not breached by the sale of air tight stoves by plaintiff. (Kentucky Court of Appeals. *Peck-Williamson Heating & Ventilating Company vs. Miller & Harris*, 118 Southwestern Rep. 876.)

Sales—Seller's Remedy—Delivery.—The measure of dam-

ages for the refusal of a buyer to accept a completely manufactured article is not the purchase price but the difference between the contract price and the market value at the time and place when acceptance is required. Delivery by a seller to a carrier, selected by himself, of articles manufactured under a contract for their sale, without the authority or knowledge of the buyer, does not constitute an acceptance by the buyer under the contract. Under a contract for the building of motor engines by plaintiff for defendant, which provided that they should be tested and accepted at plaintiff's plant, and that, in the absence of defendant's inspector, plaintiff's inspection should be accepted, inspection and acceptance at the plant before shipment were of the essence of the contract, and unless waived defendant had a right to make an inspection and test, and cannot be held to have accepted engines which were shipped without notice to him or an opportunity for inspection and test and before he knew whether any further deliveries were in fact to be made under the contract. (United Circuit Court of Appeals. *Malcomson vs. Reeves Pulley Company*, 167 Fed. Rep. 939.)

Trade Publications.

Wire Rope Shields and Lubricants.—Ohio Filler & Shield Company, Columbus, Ohio. Booklet entitled "The Lubrication of Ropes and Gears." Describes the company's adhesive compound lubricant for gears, which it is claimed increases wearing qualities and has sufficient tenacity to retain its position upon high speed gears and pinions. Other lubricants for special purposes are described and testimonials are included.

Transmission Machinery.—Hilliard Clutch & Machinery Company, Elmira, N. Y. Booklet and folder. Clutches and cut-off couplings and a full line of other transmission equipment, such as hangers, boxes, belting, &c., is listed and some of the material is illustrated in the booklet. The folder particularly deals with the clutch and cut-off coupling, describing them in detail.

Wire Straightening and Cutting Machines.—Franklin Mfg. Company, New Haven, Conn. Brochure. Describes the Crackerjack, a wire straightening and cutting machine of simple design, consisting of only two parts, the head and the extension. The head comprises the straightening device, the feed rolls and cutting off mechanism. Two sets of stationary dies are furnished with each machine, giving four sizes of holes and making the machine capable of handling all sizes of wire, from 3-16 to 1-16 in. in diameter.

Pipe Working Machinery.—Murphy Machine & Tool Company, Detroit, Mich. Catalogue, 6 x 9 in., 45 pages. Automatic collapsing taps and reamers are illustrated, together with automatic opening dies and a line of machinery including automatic double head nipple machines, semiautomatic double head nipple and pipe threading machines, roller pipe cutting-off machines, tapping machines, improved three-jaw quick acting tapping chucks, an indexed ball bearing revolving fitting and valve chuck, grinders for cutter wheels and pipe dies, multiple head push nipple lathes and double spindle tapping attachments.

Bridge Railing and Iron Fencing.—Chester B. Albee Iron Works Company, Allegheny, Pa. Catalogue No. 5, 6 x 9 in., 174 pages. This is a catalogue of designs of bridge railings, portal crestings, newels and lamp posts, cornice and fascias, stairways, portals, &c., for bridges, and fence and gate designs, window guards and park benches. Some especially attractive designs for iron fencing are shown, together with views of elaborate lamp posts, &c. Mention is made of the fact that the company manufactures steel forgings and pneumatic and hydraulic riveting machinery.

Power Punching and Shearing Machinery.—Long & Allstatter Company, Hamilton, Ohio. Catalogue No. 21, 7 x 10 in., 208 pages. A well compiled volume showing an especially complete line of punching and shearing equipment, including multiple punches, punches and riveting machine, motor driven punch and shear, angle iron shear, beam punching and coping machines, bending and forming machines and a double punch and shear.

Wood Working Machinery.—Crescent Machine Company, Leetonia, Ohio. Catalogue, 4 x 6 in., 80 pages. Illustrates a full line of wood working machinery, including a new type of saw table just brought out by the company. The table is larger than the average saw table and is made in two sections, one of which slides on rollers, making the machine better adapted for cut-off and dado purposes. A 28-in. surfer, which is also an addition to the company's line and which is especially adapted for heavy work, is illustrated and described, as is a variety wood worker recently introduced. This machine is a combination jointer, borer, saw table, pole rounder, shaper and emery grinder.

Natural Gas Burners.—Tate, Jones & Co., Pittsburgh, Pa. Circular No. 124. Contains ready reference tables relating to the use of natural gas as a fuel.

Rolls.—Seaman, Sleeth Company, Phoenix Roll Works, Pittsburgh, Pa. Catalogue, 8 x 11 in., 61 pages. Several views of

the company's plant are shown, of which a short description is given, and there follow views of chilled and semi-steel rolls, blooming rolls, beam blank rolls, rail roughing rolls, finishing rolls, &c. Views of several installations are included, as is a list of companies using the rolls.

Retail Coal Pockets and Silent Chain.—Link-Belt Company, Philadelphia, Pa. Publication No. 72 and bulletin No. 84. The first shows a number of ideal layouts for retail coal pockets and includes illustrations of installations, together with diagrams of an overhead and ground storage pocket built at Steelton, Pa. Machinery such as elevators, buckets, conveyors, &c., used in connection with coal handling are given. The Maximum silent chain, high speed drive, is treated of in the bulletin and is shown operating line shafts, roll lathes, multiple-spindle drilling machines, pressure pumps, &c.

Rope Drives.—Dodge Mfg. Company, Mishawaka, Pa. Catalogue, 9 x 11½ in., 108 pages. This publication is called "Twenty-five Years of Rope Driving" and contains a review of the history of the development of rope drives as worked out by the Dodge Mfg. Company, and discussion of the advantages of the American system of rope drive over the English system. The latter is rather extended and illustrates its points with views of installations. Large sheave wheels are shown and considerable space is given to describing installations of rope drives and their adaptability for different work is referred to. Views of typical installations of rope drive in service of all sorts occupies more than 50 pages of the book.

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Four bulletins. Bulletin 4664 treats of direct connected engine driven railroad generators, form S, made in sizes from 100 kw to 2700 kw. No. 4666 describes an improved form of the type H transformer, which has a new suspension hook as well as a new device for clamping the transformers in the cases. No. 4668 describes in detail the GE-216-A railroad motor, and No. 4670 treats of gaskets and bell mouths for conduit wirings.

Electric Motors.—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3216, replacing No. 3213. Refers to a bipolar ventilated motor of 1 hp. capacity for direct current.

Tanks, Stacks and Structural Work.—Des Moines Bridge & Iron Company, Des Moines, Iowa. Catalogue, 5½ x 8½ in., 52 pages. A number of power stations of small water works systems are shown, but the book deals chiefly with water towers and stand pipes, of which there are a number of views. An interesting view is that of a steel tank built beside an old wooden tank which it replaced, giving an excellent opportunity to compare the two types. Attention is called to the fact that the steel tank has only four legs where the wooden tank has 12. A map of Minnesota and Wisconsin showing the water tanks built by the company at different points in those States is included, together with useful data and tables. Several views of iron and steel work on structures are also given.

Boat Building and Repairing.—Waters, Gildersleeve, Colver Company, successor to F. A. Verdon Company, West New Brighton, S. I. Booklet. Describes the company's plant, which is especially adapted for building and repairing harbor craft. A map shows its convenient location on the Kill von Kull River between New York Bay and Newark Bay, and there are a number of illustrations of boats and machinery built by the company.

Electrical Equipment.—Holtzer-Cabot Electric Company, Brookline, Mass. Folders and circulars. These show electric annunciators, automobile accessories, bells, exchange telephone apparatus and various other equipment manufactured by the company.

Supplies.—Central Machinery & Supply Company, Inc., Chicago. Catalogue No. 45, revised edition. Contains price-lists, illustrations and description of a comprehensive line of manufacturers', plumbers' and farmers' supplies, including a miscellaneous assortment of merchandise.

Quarrying and Mining Tools.—Sullivan Machinery Company, Chicago. June number of *Mine and Quarry*, published by the company's advertising department. Contains a well illustrated description of the quarries of the Vermont Marble Company, in which the methods of work and the tools used in cutting out rock are shown and described. Other articles of like character deal with silver mining at Cobalt, in northern Ontario; the driving of the Mauch Chunk drainage tunnel near Mauch Chunk, Pa., and coal mining at Gary, W. Va., from which coal and coke are furnished for the United States Steel Corporation's plants in the Chicago District.

The Joliet Steel Car Mfg. Company.—A new steel consuming establishment, for which plans are being made and which is indicative of the trend in car construction, is that of the Joliet Steel Car Mfg. Company, Joliet, Ill., of which Robert B. Campbell, formerly general manager of the Elgin, Joliet & Eastern Railroad Company, is president. It is understood that a tract of 60 acres of land about 2½ miles southwest of Joliet has been secured as a site for the proposed plant, the construction of which will probably be begun this year.

An English Steel Consolidation.

The details of the proposed consolidation of a number of concerns in the West of England are announced. There are included the Workington Iron Company, which has three blast furnaces at Workington making spiegeleisen, ferromanganese, silico-spiegel and ferrosilicon; Harrington Iron & Coal Company, Ltd., which owns mines at Egremont and Harrington and has four blast furnaces at Harrington, making Bessemer pig; Moss Bay Hematite Iron & Sheet Company, Ltd., which operates mines at Egremont and Workington and has four furnaces making Bessemer pig, a three-converter Bessemer plant and one 30-ton open hearth furnace, and rolls billets, rails and angles; and the Cumberland properties of Cammell Laird & Co., Ltd., comprising iron mines at Bigrigg and Yeathouse, three blast furnaces at Maryport and five furnaces at Workington making Bessemer pig and three producing spiegeleisen.

The new company, which will probably be called the Workington Iron & Steel Company, Ltd., will have a nominal share capital of £2,000,000, divided into 800,000 preferred shares of £1 each (carrying a cumulative dividend of 6 per cent. per annum on the capital for the time being paid up thereon and preferential also as to capital) and 1,200,000 ordinary shares of £1 each. Of this share capital approximately 750,000 preferred shares and 1,091,000 ordinary shares will be allotted as fully paid to the different vendor companies or their nominees in satisfaction of purchase money as follows:

Name of company.	Preference.	Ordinary.	Total.
Workington Company.....	£75,000	£495,000	£570,000
Harrington Company.....	75,000	125,000	200,000
Moss Bay Company.....	269,000	171,000	440,000
Cammell Laird & Co., Ltd.:			
For the Cumberland properties and good will, approximately	181,000	300,000	481,000
And in addition for stock to the value of £150,000, to be taken over and paid for in preference shares.....	150,000	.....	150,000
Totals	£750,000	£1,091,000	£1,841,000

The remaining shares will be available for future use. The preferred shares do not carry the right to vote. There is to be an understanding that Cammell Laird & Co. shall not manufacture steel rails except at their Penistone Works, and that the capacity there shall be limited to one mill. They are obviously restricting themselves to their other Sheffield interests.

A Metal Exchange Copper Transaction.

On June 7, for the first time in a number of years, an actual sale of copper was made on the New York Metal Exchange. A member of the Committee on Prices sold James E. Pope, president of the Pope Metals Company, 50 tons of electrolytic copper for August delivery at 13 cents a pound.

The copper was sold at a price which struck an exact average between the day's "official" quotations, which gave the metal a range from 12½ to 13½. The fact that a member of the Price Committee was willing to do business with the "official" figures as a basis formed one of the arguments brought forward at a subsequent board meeting to evidence the good faith of the price fixers and to discredit the assertions of the reform element on the Exchange, which has long contended that copper could not be bought at the Exchange's low quotations nor sold at its high.

At another meeting of the board Mr. Pope was appointed chairman of a special committee to consider and report on reforms in the business methods of the Exchange. The committee is to consider the entire subject of business on the Exchange, but will devote itself principally to the abuses criticised by the Hughes commission and will endeavor to devise a plan whereby actual transactions in copper and other metals may take place. The committee has been instructed to report on July 22.

The Standard Tin Plate Company, Canonsburg, Pa., started up its tin plate plant in full last week. It now

has 10 hot tin mills, having recently completed the building of four mills, which have been successfully started.

The Damaged Turbine of the Salem.

The recent 24-hr. speed trial of the sister ships Salem, Chester and Birmingham was won by the Chester. When the race was about half finished the Birmingham, fitted with reciprocating engines, dropped out. The Chester was fitted with the Parsons turbines, while the Salem was equipped with the Curtis turbines. In a previous speed trial the Chester had averaged 26.52 knots per hour and the Salem 25.95 knots. The Salem was beaten a distance of 12.8 knots. However, during the race the Salem had trouble with her motive power. The starboard engine was found to be revolving at less speed than the one on the port side. In fact, the discrepancy amounted to as much as 15 rev. per min. during part of the race. And this occurred notwithstanding equality in the steam supply.

The defeat of the Salem and the suspicion of something wrong with her starboard turbine have both had light thrown on them by an examination of the suspected engine. Upon the return of the vessel to her builders at Quincy, Mass., the blading was exposed. It was then found that the blades in the first row of the fifth stage had in some manner been bent over so as to interfere with the passage of steam through the buckets. About 25 per cent. of the division plates between the nozzles or guides which direct the steam into the buckets were found to have been broken. Apparently some loose piece of metal had been caught between the row of nozzles and the row of buckets, but no such piece seems to have been discovered. A 5/8-in. nut was discovered loose in the casing, but, it is said, this nut had not become caught. This statement apparently rests on failure to discover suitable damage on the nut.

In both the Curtis and Parsons engines the rows of moving buckets alternate with rows of stationary guides or nozzles. A slight axial movement of the one set would cause actual contact. And that is what occurred on the Salem. The rotors of both turbines (port and starboard) were discovered to have been longitudinally displaced, with the result that in the first and second stages, where the allowance for clearance is least, a rubbing did occur, but this was insufficient to strip off any of the blades. Notwithstanding the damage which has been described, the Salem made about 24½ knots on the average for the full 24 hr. As the total distance by which she was defeated was 12.8 knots, her average speed was but 0.53 knot per hour less than that of the Chester. In view of the subsequent examination of her turbines it is too much to say that the Salem lost anything more than that particular race. It is distinctly an open question which is the better marine type for the development of speed sustained for a considerable time—the impulse or the reaction turbine.

Large Increase in Lake Ore Shipments.

Naturally the current shipments of Lake Superior ores are much greater than at the corresponding time in 1908, when the iron trade was dragging and furnace yards were well stocked with ore carried over from 1907. Last month, in spite of the vessel strike, the ore movement was more than double that for June, 1908. The figures by upper lake ports for June, 1909 and 1908, and for both seasons to July 1 are as follows in gross tons:

	June, 1909.	June, 1908.	To July 1, 1909.	To July 1, 1908.
Escanaba	747,377	254,496	1,132,233	270,741
Marquette	287,127	119,014	420,224	119,014
Ashland	371,169	250,449	612,024	271,577
Superior	856,062	345,845	1,484,577	478,663
Duluth	1,968,800	1,078,118	3,184,725	1,164,809
Two Harbors.....	1,162,720	537,760	1,888,540	566,198
Totals	5,393,255	2,585,682	8,702,323	2,870,997

It will be seen that the total movement to July 1 this year was more than three times that of last year to the same date.

OBITUARY.

THOMAS F. WITHERBEE.

Thomas F. Witherbee, for more than 40 years a most successful manager of blast furnaces, died in Durango, Mexico, July 11, from the result of two paralytic strokes within four months. His career began at about 1865, at Fletcherville, N. Y., where he was the first in America to use a chemical laboratory as a regular adjunct to a furnace. In 1872 he built the Cedar Point Furnace at Port Henry, N. Y., when he was the first in this country to erect the Whitwell fire brick stoves, and introduced several inventions of his own. Among these were the bronze tuyeres which bear his name, the cinder notch cooler, the use of dynamite in removing obstructions in the furnace, and the kerosene blowpipe for opening up closed tuyeres and tapping holes. In 1887 he was called to be superintendent of a blast furnace in Durango, Mexico, in connection with mines at Iron Mountain. In 1895 he took charge of the Calumet Furnace in Chicago, and the next year went to Mayville, Wis., where he was furnace superintendent for about four years. He was then recalled to Durango, where he died.

Mr. Witherbee has contributed many valuable papers on iron and steel metallurgy to the American Institute of Mining Engineers, which attracted much attention. He was naturally an inventor of new methods and instruments, for which he held more than 15 patents, and he was at work on a new invention just before his last illness. His mechanical genius was shown at the age of 13 years, when he made a toy steamboat and a working engine with which he sawed wood.

DEXTER PRATT, Boston, Mass., for many years a member of the firm of Pratt, Trumble & Co., is dead at the age of 83. He was a native of Weymouth, Mass. He was a bridge engineer and builder, and his career included some notable engineering work.

ROBERT D. EVANS, Boston, Mass., prominent in great mining and rubber enterprises, died as the result of an accident July 6, aged 67 years. He was a native of St. John, N. B., and went to Boston as a boy, finding employment as clerk for the Eagle Rubber Company. A few years later he went into business for himself in the firm of Clapp, Evans & Co. He was one of the leaders of the American Rubber Company during its inception, and with its consolidation in the United States Rubber Company he became head of that corporation. In 1899 he organized the United States Mining Company, and was associated in the management of its successor, the United States Smelting, Refining & Mining Company. He was deeply interested in art and was a director of the Boston Museum of Fine Arts. He leaves a widow.

GEORGE W. JACQUES, for 10 years one of the managers of the New York Metal Exchange, died suddenly July 8 of apoplexy at a board meeting, which had been called to act on the Hughes commission's recommendation that the charter of the exchange be revoked. His death brought the discussion and the meeting to an end. Mr. Jacques was a native of New York City and was 63 years old. He had been a member of the exchange for 20 years. He began business as a boy with the old-time tin plate importing house of A. A. Thomson & Co., and when tariff changes encouraged the development of the tin plate industry here he engaged for a while in the manufacture of tin plate himself. Later he went back with his old firm and remained with it until its dissolution several years ago. He leaves a widow, two sons and a daughter.

John Graham, receiver for the Crum Lynne Iron & Steel Company, which some years ago operated the plant at Eddystone Station, Delaware County, Pa., has made his final account and is distributing the last dividend among the creditors. He has succeeded in paying the creditors in full, with interest equal to about 7 per cent. This is certainly a most unusual showing for a bankruptcy proceeding.

PERSONAL.

F. F. Prentiss, president of the Cleveland Twist Drill Company, Cleveland, Ohio, sailed July 15 for Europe, where he will spend about two months in an automobile tour.

Frank A. Scott, formerly secretary of the Cleveland Chamber of Commerce, Cleveland, Ohio, has resigned his position as one of the receivers of the Municipal Traction Company to become secretary and treasurer of the Warner & Swasey Company. He will assume his new duties about September 15.

Dr. Richard Moldenke of Watchung, N. J., secretary of the American Foundrymen's Association, will leave in the middle of August to attend the Copenhagen congress of the International Society for Testing Materials and from there will go to Germany and France on professional business. He expects to return toward the middle of October.

The Republic Iron & Steel Company announces that, effective July 15, Joseph B. Johnson, Jr., has been appointed general superintendent of the Thomas Division of the company at Birmingham, Ala., succeeding F. B. Keiser, resigned. He will be in general charge of the business affairs of the company as related to the Thomas Division. Mr. Johnson has until recently held the position of general manager of the Princess Furnace Company, Glen Wilton, Va.

W. J. Filbert, comptroller of the United States Steel Corporation, has returned from Europe.

C. E. Groesbeck of San Diego, Cal., has been elected a vice-president of H. M. Bylesby & Co., Chicago, and will have charge of their interests on the Pacific Coast and in the States of Idaho and Montana. He will make his headquarters at Tacoma, Wash.

The A. M. Byers Company, Pittsburgh, has appointed Geo. F. Hughson its Western representative, with office in the First National Bank Building, Chicago.

For the purpose of enlarging its New York interests and developing the engineering end in connection with large steam power installations the E. Keeler Company, Williamsport, Pa., has associated with it T. R. Brown as chief engineer, with headquarters at 29 Broadway, New York. Mr. Brown was formerly connected with the Pennsylvania Railroad as master mechanic of the Juniata Shops at Altoona; also with the Westinghouse interests and lately with the American Car & Foundry Company.

Benjamin Whittaker has resigned as treasurer of J. H. Williams & Co., drop forgings, Brooklyn, N. Y., and will now give his entire time to the exporting business for that firm and others, with headquarters at 17 State street, New York.

Hugh M. Wilson, formerly editor and publisher of the *Railway Age*, will on August 1 become associated with the Barney & Smith Car Company, Dayton, Ohio, of which he has been elected a director and a vice-president. Mr. Wilson disposed of his publishing business over a year ago and has spent most of the time since in foreign travel, only recently returning to the United States.

Irvin McDowell has withdrawn from the firm of David Evans & Co., Chicago, and will shortly engage in business on his own account.

Chairman Elbert H. Gary of the United States Steel Corporation sailed for Europe on Tuesday, expecting to remain abroad for about two months.

James M. Swank, the veteran manager of the American Iron & Steel Association, Philadelphia, was 77 years old on July 12. Mr. Swank is still energetically conducting the work of that association, as no successor has yet been selected to take his place, although he tendered his resignation last January.

Kirk Brown, general manager of the Yale & Towne Mfg. Company, has resigned for the purpose of availing himself of another business opportunity. Walter C. Allen, general superintendent of the works, has been ap-

pointed to the position thus made vacant, with headquarters in New York, and will assume its duties July 19 on returning from his vacation. Secretary J. H. Towne will take charge of the work of the general manager in the meantime. Joseph A. Horne, assistant general superintendent, has been appointed to the position of general superintendent made vacant by Mr. Allen's transfer.

W. A. Maxwell has been appointed district superintendent of the four open hearth departments of the Homestead Works of the Carnegie Steel Company at Homestead, Pa. Reese James is the general superintendent.

Sanford B. Belden, for some years Eastern sales manager of the Jeffrey Mfg. Company, Columbus, Ohio, with headquarters in Pittsburgh, has been made general sales agent of that company, resident at Columbus, Ohio. C. M. Blanchard, who has been Mr. Blanchard's assistant in the Pittsburgh office, succeeds him as Eastern sales manager.

Sir Robert Hadfield of Sheffield has returned home, after a stay in this country of some months.

W. E. Corey, president of the United States Steel Corporation, arrived from France on Tuesday.

President John Sargeant of the Domhoff & Joyce Company, Cincinnati, is en route to his old home in the Yorkshire District, England. He is expected to return about August 1.

A Side Rod Electric Locomotive.

An electric locomotive in which the motors are mounted on top of the frames and connected to the driving wheels by rods and cranks, instead of being mounted directly on the axles or geared to them, has been built by the American Locomotive Company in connection with the General Electric Company, both of Schenectady, N. Y. Two 800-hp. single-phase 15-cycle motors provide the drive developing a tractive effort of 30,000 lb. at 18 miles an hour. The maximum speed is 50 miles per hour, and can be made in either direction. The frame and running gear resemble that of a Pacific type steam locomotive having 12 wheels. The three pairs of 49-in. driving wheels are connected together, and at each end to crankshafts in turn driven by inclined connecting rods to cranks with flexible couplings on each end of each motor shaft. The cranks on the opposite sides are at right angles, so that there is no dead center.

At one end of the locomotive is a four-wheeled bogie truck with 36-in. wheels, and at the other end a radial two-wheeled pony truck with wheels of the same size. The total wheel base is 36 1/4 ft., but the rigid wheel base is only 10 ft. The total weight of the locomotive is 250,000 lb., of which 162,000 lb. come upon the driving wheels.

The advantages of the arrangement are that the motors can have exceptionally large bearings and be spring supported on the frame, where they are less subject to shocks than when carried as a dead weight on the axles. Both motors being located near the center of the frame, a large part of the load is concentrated over the driving wheels, and the moment of inertia of the entire locomotive around its vertical axis is reduced, correspondingly decreasing the lateral rail pressure, and consequently the wear on the rail head and wheel flanges.

The Halcomb Steel Company, Syracuse, N. Y., has issued an exceptionally attractive publication entitled "Catalogue and Hints on Steel." It is bound in cloth, comprises 78 pages and is printed in colors. In each case when the properties of a special brand are set forth, a facsimile of the company's label is inserted therewith. The reproductions of these labels are strikingly prominent. A considerable part of the publication is devoted to directions for annealing, hardening, forging, &c. Special chapters are given to alloy steels, railroad, mining and quarry steels and cold-drawn and cold-rolled productions. The concluding pages present a large number of tables of interest and value to steelmakers.

NEWS OF THE WORKS.

Iron and Steel.

The McGugin Iron & Coal Company, operating Olive Furnace in Lawrence County, Ohio, has been placed in the hands of receivers. The liabilities are said to be about \$100,000.

The Buffalo Union Furnace Company, Buffalo, N. Y., had two furnaces in blast July 1. Furnace C having been blown in in June.

No. 1 furnace of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., has been put in blast. No. 3 furnace at the same plant is being repaired and will probably be in blast within 10 days.

No. 1 furnace of the Woodstock Iron & Steel Company at Anniston, Ala., will blow in August 8.

The plant of the Carnes-Wieman Company at Helena, Ark., is being repaired.

The Athenia Steel & Wire Company, Athenia, N. J., which made a number of additions to its plant the past year, is now duplicating the power plant, the new installation to consist of a 225-hp. engine, generators and boilers. This last addition was made necessary by the increase in business which the company has felt the past six months. The J. Wilkes Company, 135 William street, New York, is the company's selling agent.

General Machinery.

The C. N. Cady Company, Canastota, N. Y., formerly engaged in marine engine construction, announces that it will enter the field of automobile engine construction, and while its plants have not as yet been definitely determined, it expects to more than double the capacity of its plant during the present year.

Foundries.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., intends to install a 20-ton open hearth furnace within the next 60 days, contract for which has been placed with S. R. Smythe & Co., Pittsburgh, Pa.

The Bancroft, Ross & Sinclair Company, New Orleans, La., founder and machinist, claims to be the only maker of steel castings in the South. It has a 6000-lb. converter and is able to make from 15,000 to 20,000 lb. of steel castings every two or three hours. The converter is located near the iron foundry which the company has been operating for a number of years.

Evidence of the increasing demand for gas engines for motive power service is found in the frequent demand for increased capacity of such plants. An example of this tendency is noted in the plans of the Olds Gas Power Company, Lansing, Mich., for the enlargement of its foundry department by the erection of an addition, 140 x 175 ft. Owing to the rapid increase of business there is urgent need for more foundry room, and the work will be pushed in order to have it ready for business as soon as possible.

Bridges and Buildings.

The McClintic-Marshall Construction Company, Pittsburgh, Pa., has secured the contract for the steel work for track elevation of the Belt Railroad & Stockyards Company, Indianapolis, Ind., and the American Construction Company, Indianapolis, the concrete work. The total cost is \$150,000.

O'Keefe & Orbison, Appleton, Wis., have taken contract for two miles of steel and concrete bridge work across the waterways at Neenah, Wis., involving an expenditure by the Chicago & Northwestern Railroad of \$1,500,000.

Thomas J. Lannen, 369 Pearl street, Buffalo, N. Y., has received the contract for the construction complete of a \$150,000 theater building to be erected at Albany, N. Y. Contract includes 225 tons of structural steel work, for which he is now receiving sub-bids, also a large quantity of open hearth steel rods for reinforcing concrete.

Power Plant Equipment.

Plans for the erection of an electric light plant and installation of machinery for the Illinois Soldiers' and Sailors' Home, Quincy, Ill., are being prepared by W. L. Fergus, Fisher Building, Chicago. Contracts for the machinery and material for this improvement probably will be let within the next week or two.

A new tubular boiler is to be purchased by the Walter Cabinet Company, Wayland, Mich.

The American Seating Company, Grand Rapids, Mich., has contracted for an addition to its factory and is having plans drawn for a new building, with power plant, to be erected next year.

The rebuilding of the entire system of the Spring Valley Electric Light Company's plant at Spring Valley, Ill., is under consideration.

At Bryant, S. D., the municipality will purchase machinery for a water works system and electric plant.

The new power house of the Brown & Sharpe Mfg. Company, Providence, R. I., which is to be a consolidation of its five sep-

erate power plants, will ultimately have a capacity of about 3000 hp. With electric drive, gas engines and producers, stirring water tube boilers and Taylor gravity underfeed stokers, the new plant will be made thoroughly up to date in equipment.

The Northwestern Gas & Electric Company is reported to be having plans drawn for a new 5000-hp. power plant at Walla Walla, Ore. Headquarters are at Portland.

It is reported that two power plants aggregating 12,000 kw. capacity, equipped with hydraulic turbines, will be erected by the Oklahoma Midland Electric Railway, Hobart, Ind.

The Kingsville Power Company, Kingsville, Texas, has awarded contract to the Rathbun-Jones Engineering Company, Toledo, Ohio, for building water works and a power and lighting plant.

The Noblesville Heat, Light & Power Company, Noblesville, Ind., has increased its capital stock from \$50,000 to \$70,000.

The City Council of Knightstown, Ind., has authorized the trustees of the municipal water and light plant to purchase two additional dynamos and other machinery for the light and power department.

Contracts have been let for the erection of a three-story factory building and power house by the R. J. Preiss Company, Milwaukee, Wis. The power plant equipment has not yet been purchased, but contracts are soon to be let for two 80 hp. boilers, also engine and generator.

A steam turbine or Corliss engine of about 300 to 500 hp. is to be purchased by the city of Rochester, Minn., together with generator and other apparatus for the municipal lighting and power station.

The Cataract Power & Conduit Company, Fidelity Building, Buffalo, N. Y., is having plans prepared by Consulting Engineer E. D. Pith of Niagara Falls, Ont., for a \$100,000 brick and steel addition to its powerhouse building at Niagara Falls.

The Board of Public Works, Buffalo, N. Y., has awarded contract to the Holly Mfg. Company for two new 30,000,000 gal. steam pumping engines to be installed in the Massachusetts avenue pumping station.

The Hartford City Lighting Company, Hartford, Ind., will spend \$75,000 in enlarging its power plant. It is proposed to supply several neighboring smaller towns with light and power.

Bids will be received until July 22 by the Board of Trustees of Louisville, Ind., for steel substructure and tank, gasoline engine and power pumping machinery, pipes, hydrants and other material for a waterworks system. J. A. Bartlett is president of the board.

Fires.

The plant of the Modern Machine Works, St. John, Ore., owned by Bennett & Murphy, was destroyed by fire July 13.

The plant of the A. Walrath Company, Fort Plain, N. Y., was burned July 11, the loss being about \$30,000.

The plants of the Somerville Iron Works and the Carbon Stove Company, East Somerville, N. J., were destroyed by fire July 8, the combined loss being about \$80,000.

The plant of the Buffalo Reduction Company, East Buffalo, N. Y., including much valuable machinery, was destroyed by fire July 9, the loss being \$150,000. It is expected that the plant will be rebuilt. Millard J. Windsor is general manager, 968 William street, Buffalo.

The plant of the Brooks Machine Company at Falls View, Niagara Falls, Ont., was destroyed by fire July 5.

Miscellaneous.

The Clinton (Iowa) Bridge & Iron Works has taken contract for a 12,000-gal. steel tank at Toledo, Iowa. Marshalltown, Iowa, authorities have readvertised for bids on a steel tank for that city.

The American Trust & Savings Bank, Chicago, Ill., has been appointed receiver for the Monarch Motor Company, Chicago Heights, which has liabilities estimated at \$50,000.

We understand that the new building in process of erection by the Frog, Switch & Mfg. Company, Carlisle, Pa., to replace the building recently destroyed by fire, will be of steel and concrete construction, having an extreme length of 460 ft. and an extreme width of 165 ft., with two electric traveling cranes running the entire length of the shop, and a third one in the loading department. All of the machinery will be run by electric power on the individual machine plan, and not in groups, excepting where the machines are small. The equipment will be from 25 to 50 per cent. beyond that of the old shop, and we understand it will give the company a capacity of from 20,000 to 25,000 frogs and switches per year, with a similar increase in the production of other articles it has been supplying to railroads and mines. The McClintic-Marshall Construction Company, Pottstown, Pa., is to furnish the steel work, and the walls of the building will be of concrete reinforced. The windows will have lighting surface of about 15,000 sq. ft., and the skylight capacity will about equal that of the windows, so that the building will be well lighted by daytime, and at night by an abundance of electric light. The windows will each consist of one sash without a window frame, and fixed on pivots above and below, so as to open on a line perpendicular to the line of

the wall, and thus give the greatest possible amount of ventilation. It is expected that the new building will be equipped and in full operation by September 1.

The International Lead Company, 71 Broadway, New York, is erecting a plant, 70 x 75 ft., at Bayonne, N. J., for the manufacture of lead pipe and other products. It is planned to spend about \$25,000 in building the plant and additional buildings will be erected later. It is said that the company has a patented process which cheapens the cost of manufactured lead pipe.

The Keystone Supply & Mfg. Company, Philadelphia, Pa., manufacturer of steam, gas and water supplies, is to make important improvements to its property at 917 to 949 North Ninth street, contract for which has not been let.

The Middle West Portland Cement Company, in which Thos. J. Anderson, Iola, Kan., is interested, will put up a new plant near that city.

Kennard, Neb., authorities have awarded the National Construction Company, South Bend, Ind., contract for the installation of a complete water works system, for which machinery of guaranteed economy will be required.

The Otis Elevator Company has secured control of the Parkhurst Elevator Company at Peru, Ind., and the plant is being enlarged. J. W. Parkhurst is retained as manager.

The American Steel Wheel Company, Alexandria, Ind., at its annual meeting elected the following officers: President, H. V. Otto, Alexandria; vice-president, J. S. Postal, Bluffton; second vice-president, M. J. Ready, Indianapolis; secretary-treasurer, A. A. Gallman, Alexandria. The new factory is completed and equipped and is about ready to begin manufacturing hollow steel wagon wheels.

H. M. Byleshy & Co., Chicago, Ill., have acquired the Tacoma Gas Light property at Tacoma, Wash.

A new type of ore car, or larie, with self-oiling wheels, has been brought out by the Silver Bros. Iron Works Company, Salt Lake City, Utah.

It is reported from Ashford, Wash., that the Irondale Steel Company will install by-products coke ovens.

The Indiana Engineering Company, general contractor, has been incorporated at Indianapolis, Ind., with \$30,000 capital stock, by Henry T. Wilkerson, Albert R. Rowsell and Gilbert L. Helm.

The Harrisburg Iron & Steel Company has been incorporated to take over the Harrisburg, Pa., branch of the United American Iron & Steel Company, and will continue the business of buying and selling scrap iron and steel and the sale of new bar iron and rods. The company's buildings and tracks cover 5½ acres and its yard is one of the most modern in the country, being equipped with five large shears, its own switching engine, locomotive cranes, magnets, &c., and its trackage will accommodate 90 cars. The new company has the same Board of Directors as the United American Iron & Steel Company.

The Carborundum Company, Niagara Falls, N. Y., will soon begin the erection of an addition to its plant almost equaling in size the present buildings. The new building will be used for the manufacture of abrasive paper.

The Indiana Automatic Gas Machine Company has been organized at Indianapolis, Ind., with \$75,000 capital stock, to manufacture heating and lighting apparatus. The incorporators are August M. Kuhn, John W. Kern and Charles Pegman of Indianapolis, and Jerome Herff of Peru, Ind.

The Rider-Lewis Motor Car Company is building a large factory at Anderson, Ind., which it expects to have in operation in 60 days. A large part of the machinery will be moved from its factory at Muncie, Ind.

The Crawfordsville Seed & Grain Separator Company has been incorporated at Crawfordsville, Ind., with \$50,000 capital stock, to manufacture farm machinery. The incorporators are Sanford H. Drybread, Jacob A. Stewart, Perry F. Stump, Walter G. Thomas, John H. Elder, Harry T. Stout, John R. Coons, Henry D. Vancleave and Clinton R. Marshall.

The Crescent Emery-Corundum Wheel Company, Indianapolis, Ind., has increased its capital stock from \$8,000 to \$10,000.

The Atlas Locomotive Ashpan Company, Ft. Wayne, Ind., has obtained the contract to equip the locomotives of the Chicago Terminal Company.

Lathrop & Shea, New Haven, Conn., and Buffalo, N. Y., were awarded contract last week for 16 miles of new railroad construction, including 1,000,000 cu. yds. of earth and rock excavation between Poughkeepsie, N. Y., and Hopewell Junction; also about 16,000 cu. yds. of concrete work. Contract includes construction complete except furnishing of steel rails. Contract price of the work is about \$800,000.

The Ontario Pump Mfg. Company, Rochester, N. Y., has been incorporated with a capital stock of \$10,000 to manufacture pumps. The incorporators are Thomas T. Grasser, Roscoe R. Stith, W. Stevens Hall, Harvey I. Barber and G. P. Barber, all of Rochester.

The Iron and Metal Trades

A More Cheerful Tone.

Another Large Sale of Bessemer Pig.

A very much more cheerful tone pervades the whole iron trade, and any falling off in activity which may develop during the balance of the month and in the first half of August will be accepted without any uneasiness. In some finished lines, notably in steel bars, plates and shapes, the mills are in such a condition that deliveries are being delayed, and it is regarded as probable by some observers of present tendencies that the question of making reasonable deliveries may soon become a serious problem.

Sellers are advancing the prices without apparently cutting down the stream of moderate sized orders for prompt delivery. Eastern makers of steel bars and other products have virtually withdrawn from the Chicago markets.

Only small quantities of steel rails have been added to the order books of the mills, the New Haven order for about 9000 tons being divided between Bethlehem and Pennsylvania. Some additional car orders have been placed, but the outlook is more promising. The reports of large orders to be given out by a leading trunk line are inaccurate. A general programme is being worked out, which may extend over years. How much will be immediately available is still undetermined, and in any case will not embrace more than a fraction of the total talked of.

The structural trade is rather quiet so far as actual bookings are concerned. Prices for fabricated work are distinctly hardening, but pretty low figures continue to crop up for particularly desirable work. The largest single transaction involves 2000 tons of bridge work for the Lehigh Valley. Nearly all the leading railroads are coming into the market for additional moderate quantities of bridge work, and there is a good deal of building in sight.

Eastern makers of iron merchant pipe are about to follow the example of Western makers in advancing the price \$2 per net ton. There have been no further developments in the movement to consolidate a number of the larger Eastern bar iron mills.

A significant situation is developing in the Central West in Bessemer pig iron. A Mahoning Valley steel plant has purchased 25,000 tons for delivery during the second half, and it is probable that a leading Pittsburgh steel company will add to purchases recently made. In view of the fact that the furnace capacity is very fully employed, it may develop that the United States Steel Corporation, too, may appear as a buyer of Bessemer pig before long.

The pig iron purchases of the leading implement company are estimated to have aggregated between 50,000 and 55,000 tons. The radiator makers are still in the market, and the pipe makers have been buying additional quantities. The statement is made in the annual report of the principal manufacturer of steam pumps that requirements of pig iron, copper, tin, &c., had been covered for a long period ahead. The purchases of pig iron began in May and extended into June, and were placed in the Buffalo, Eastern and Southern markets.

Steel makers are in the market for considerable quantities of ferromanganese, the deliveries asked extending in some instances over the first half of next year.

The copper trade is marking time. In lead resales by consumers have been the main source of recent weakness.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 14, 1909	July 7, 1909	June 9, 1909	July 8, 1908
PIG IRON, Per Gross Ton :				
Foundry No. 2, standard, Philadelphia	16.50	16.50	16.50	16.50
Foundry No. 2, Southern, Cincinnati	15.75	15.75	14.50	15.25
Foundry No. 2, local, Chicago	17.00	17.00	16.50	17.85
Basic, delivered, eastern Pa.	15.50	15.50	15.50	15.25
Basic, Valley furnace	15.00	15.00	14.50	15.00
Bessemer, Pittsburgh	16.40	16.15	15.90	16.90
Gray forge, Pittsburgh	14.90	14.85	14.85	14.90
Lake Superior charcoal, Chicago	19.50	19.50	19.50	20.00

BILLETS, &c., Per Gross Ton :

Steel billets, Pittsburgh	23.00	23.00	23.00	25.00
Forging billets, Pittsburgh	27.00	27.00	25.00	27.00
Open hearth billets, Philadelphia	25.00	25.00	25.00	26.20
Wire rods, Pittsburgh	29.00	29.00	29.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton :

Steel rails, melting, Chicago	14.50	14.50	14.75	12.50
Steel rails, melting, Philadelphia	10.00	16.00	15.75	13.50
Iron rails, Chicago	17.00	17.00	17.00	15.50
Iron rails, Philadelphia	19.50	19.50	19.50	18.00
Car wheels, Chicago	16.00	16.00	16.00	18.00
Car wheels, Philadelphia	14.75	15.25	15.00	18.50
Heavy steel scrap, Pittsburgh	15.75	16.00	15.50	14.00
Heavy steel scrap, Chicago	14.00	14.00	14.50	11.25
Heavy steel scrap, Philadelphia	16.00	16.00	15.75	13.50

FINISHED IRON AND STEEL,

Per Pound :	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.45	1.45	1.40	1.35
Common iron bars, Chicago	1.35	1.35	1.30	1.50
Common iron bars, Pittsburgh	1.45	1.45	1.30	1.40
Steel bars, tidewater, New York	1.41	1.41	1.36	1.56
Steel bars, Pittsburgh	1.25	1.25	1.20	1.40
Tank plates, tidewater, New York	1.51	1.46	1.41	1.76
Tank plates, Pittsburgh	1.35	1.30	1.25	1.60
Beams, tidewater, New York	1.51	1.46	1.41	1.76
Beams, Pittsburgh	1.35	1.30	1.25	1.60
Angles, tidewater, New York	1.51	1.46	1.41	1.76
Angles, Pittsburgh	1.35	1.30	1.25	1.60
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.45
Skelp, sheared steel, Pittsburgh	1.40	1.40	1.40	1.50

SHEETS, NAILS AND WIRE,

Per Pound :	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh	1.70	1.70	1.70	1.95
Cut nails, Pittsburgh	1.70	1.70	1.65	1.75
Barb wire, galv., Pittsburgh	2.00	2.00	2.00	2.40

METALS, Per Pound :

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.12½	13.25	13.75	12.87½
Electrolytic copper, New York	13.00	13.00	13.62½	12.62½
Spelter, New York	5.35	5.35	5.50	4.45
Spelter, St. Louis	5.27½	5.27½	5.35	4.30
Lead, New York	4.35	4.35	4.40	4.50
Lead, St. Louis	4.25	4.30	4.30	4.35
Tin, New York	28.90	29.00	29.50	28.05
Antimony, Hallett, New York	7.50	7.50	7.75	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	\$3.04	\$3.04	\$3.04	\$3.04

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 20c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.35c., net; I-beams over 15 in., 1.45c., net; H-beams over 8 in., 1.55c.; angles, 3 to 6 in., inclusive, 1/4 in. and up, 1.40c., net; angles, over 6 in., 1.45c., net; angles, 3 x 3 in. and up, less than 1/4 in., 1.55c., base, half extras, steel bar card; tees, 3 in. and up, 1.44c., net; zees, 3 in. and up, 1.40c., net; angles, channels and tees, under 3 in., 1.30c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.00c., net; hand rail tees, 2.70c., net; checkered and corrugated plates, 2.70c., net.

Plates.—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.35c., base. Extras over this price are as follows:

Tank, ship and bridge quality, 1/4 in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{3}{4}$ -in. plate. Steel plates over 72 in. wide must be ordered $\frac{3}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{3}{4}$ -in. to and including 3-16-in. plates on thin edges.	\$0.10
Gauges under 3-16-in. to and including No. 8.	.15
Gauges under No. 8 to and including No. 9.	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles.	.20
Boiler and flange steel plates.	.10
"A. B. M. A." and ordinary firebox steel plates.	.20
Still bottom steel.	.30
Marine steel.	.40
Locomotive firebox steel.	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.	.05
For widths over 110 in. up to 115 in.	.10
For widths over 115 in. up to 120 in.	.15
For widths over 120 in. up to 125 in.	.25
For widths over 125 in. up to 130 in.	.50
For widths over 130 in.	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.25c.; No. 30, 3.60c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for $\frac{1}{2}$ -in. corrugations.

Wrought Pipe.—Discounts on steel pipe, $\frac{3}{4}$ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, $3\frac{1}{2}$ to 6 in., are 77 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.	Steel.
1 to $1\frac{1}{4}$ in.	.50
$1\frac{1}{4}$ to $2\frac{1}{4}$ in.	.62
$2\frac{1}{4}$ to 5 in.	.70
2 $\frac{1}{2}$ in.	.64
6 to 18 in.	.62
$2\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.	
$2\frac{1}{2}$ in. and larger, over 22 ft. long, 10 per cent. net extra.	

Wire Rods.—Bessemer rods, \$29; chain rods, \$29; basic rods, \$29 to \$30.

Steel Rivets.—Structural rivets, 1.60c., base; boiler rivets, 1.70c., base.

Chicago.

FISHER BUILDING, July 14, 1909.—(By Telegraph.)

Market developments of the past week have been almost uniformly favorable to continued industrial expansion. Not the least of influences contributing to this result is the promising crop condition, as disclosed in the Government report, showing an unusually large corn acreage. This naturally has a strong bearing upon the situation, especially in the Middle West. On the heavier lines of finished material, such as bars, plates and shapes, specifications are coming in at a good rate and the leading mills are well sold up. Two or three Eastern producers have, in fact, practically withdrawn from the market. Deliveries are falling further behind and there are few sources from which mill shipments of these lines can be had inside of four to six weeks. The supply of billets is short of requirements. The principal producer in this district has none to offer in the outside market, being unable at present to keep up with its own needs. Prices are in consequence moving upward. The local mills of the leading interest have announced an advance of \$1 a ton, making the price of steel bars 1.43c. and of plates and shapes 1.53c., Chicago, which are declared to be the absolute minimum. The merchant pig iron furnace interests, both North and South, are now fairly well booked up on present active capacity for the third quarter at least and are not inclined to concede anything in price for further business at this time.

Pig Iron.—Although overshadowed by the heavy buying of the previous week, last week's market was fairly active, with better prices ruling. It is now understood that the purchases of the leading harvester interest amounted to between 50,000 and 55,000 tons. More than half of this amount is said to have been secured by Northern furnaces, a part of which is currently reported to have been taken for delivery extending into next year. The covering of large requirements so far ahead is indicative of a belief in an ascending scale of prices and has helped materially to strengthen the market. The local Northern furnaces are this week offering nothing better than \$16.50, furnace, for last half, and the Southern interests are holding firmly at \$12.50, Birmingham, with at least two Alabama furnaces asking \$13 for

fourth quarter. Two sales made last week of 1000 tons each of a well-known brand of Southern iron are reported at \$12.50 for fourth quarter delivery, but the seller is this week asking 50 cents a ton more. The purchase of 1000 tons of Southern foundry iron by a machinery builder in southwestern Wisconsin is also reported. There are a good many inquiries in the market for quantities ranging from 500 to 2000 tons. One of larger size, for 3000 to 4000 tons of foundry iron, comes from a Michigan stove interest. As indicative of a larger foundry consumption, it is stated that shipments are generally moving as per schedule with few requests for delayed deliveries. The following quotations are for July, August and September delivery, f.o.b. Chicago:

Lake Superior charcoal.	\$19.50 to \$20.00
Northern coke foundry, No. 1.	17.00 to 18.00
Northern coke foundry, No. 2.	17.00 to 17.50
Northern coke foundry, No. 3.	16.50 to 17.00
Northern Scotch, No. 1.	18.00 to 18.50
Southern coke, No. 1.	17.35 to 17.85
Southern coke, No. 2.	16.85 to 17.35
Southern coke, No. 3.	16.35 to 16.85
Southern coke, No. 4.	15.85 to 16.35
Southern coke, No. 1 soft.	17.35 to 17.85
Southern coke, No. 2 soft.	16.85 to 17.35
Southern gray forge.	15.35 to 15.85
Southern mottled.	15.10 to 15.60
Maleable Bessemer.	17.00 to 17.50
Standard Bessemer.	17.90 to 18.15
Jackson Co. and Kentucky silvery, 6%.	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8%.	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10%.	21.90 to 22.40

(By Mail.)

Billets and Rods.—Owing to the growing scarcity of steel, prices are much firmer, the minimum quotation on forging billets now being \$28 base, Chicago. A leading interest being short of steel for its own works has practically withdrawn from the outside market, and it is doubtful if any considerable tonnage could be obtained at the figure now ruling. No new transactions are reported.

Rails and Track Supplies.—The demand for rails last week was limited to an aggregate of 5500 tons, made up of miscellaneous orders taken by the Illinois Steel Company. Included in these bookings was an order for 460 tons of 60-ft. Bessemer rails for the Chicago & Oak Park Elevated Railway. Requirements amounting to 25,000 tons are still pending. It is significant of the pressing needs of the railroads that on all this business the quickest possible delivery is urged. There is an inquiry now in the market from the Centerville (Iowa) Light & Traction Company for 800 tons of 70-lb. rails. The rolling schedules of the Gary rail mill are filled up until the latter part of September, and the No. 1 mill at South Chicago has already booked enough business to keep it going until December. The demand for track fastenings continues unabated and there is an excellent prospect of the development of more business than can be comfortably taken care of by the mills for the rest of the year. Business in light rails has eased off somewhat, and the demand, though fairly good, is not as satisfactory as in other lines of railroad material. The following prices on light rails are said to be well maintained: 40 to 45 lb. sections, \$26; 30 to 35 lb. sections, \$26.75; 16, 20 and 25 lb. sections, \$27; 12-lb. sections, \$28; Chicago, less 50c. a ton on lots of 500 tons, and \$1 a ton on lots over 500 tons.

Structural Material.—The large projects now under negotiation seem to be slow in reaching the contract stage, though most of those heretofore reported are live enterprises, whose steel requirements will likely be included in this year's tonnage. Most of the orders taken by fabricators last week were of no significant size. The most notable are 1800 tons for the First National Bank, Denver; the fabricating contract for which was let by James Stewart & Co. to the Minneapolis Steel & Machinery Company; 121 tons for the Bradley Building, Duluth, Minn., and 380 tons for the First National Bank, San José, Cal., both of which went to the American Bridge Company. Local fabricators are pretty well supplied with work, but there is yet enough unfilled capacity to prevent the rapid advance of prices to a uniformly higher level. The market, nevertheless, is gradually hardening, and there is considerably less cutting, especially on contracts for early deliveries. The mills are receiving heavy specifications for plain material, and deliveries are gradually lengthening. Neither the Illinois Steel Company nor the Inland Steel Company is promising shipments earlier than six to eight weeks, and the schedules for the Eastern mills are filled up to an equal extent. In view of the congested condition of the mills and increasing strength of the local market, the Illinois Steel Company has this week advanced its price to 1.53c., Chicago, while the Jones & Laughlin Steel Company has moved up to a basis of 1.40c., Pittsburgh. The absolute minimum now available from any source is 1.35c., Pittsburgh.

Plates.—In addition to a good run of specifications for sheared plates from other sources, those received last week by the Illinois Steel Company were supplemented by orders against contracts from two or three of the leading car shops. More and more difficulty is being experienced by consumers in getting prompt shipments of sheared plates owing to the increasing congestion in the leading mills, both East and West. Business in universal plates has picked up sharply,

and as a result the South Works mill, which has of late been running a little light, now has specifications in hand amounting to 6000 tons. This represents a fortnight's capacity for the mill. The upward tendency in prices is manifested in an advance of \$1 a ton announced by the Jones & Laughlin Steel Company, which is now asking 1.40c., Pittsburgh. The price quoted by the leading Western mills is 1.53c., Chicago, which we are advised is the absolute minimum of the market.

Sheets.—Under the influence of a steadily growing demand and the shortened operative capacity in some of the mills of the leading interest owing to labor troubles, sheet prices are stiffening up and the sources from which concessions can be had are gradually being eliminated. The little weakness that still exists is principally in roofing sheets, for which there is no great demand at this season of the year. The announcement made last week of the proposed addition of 50 sheet mills and 50 tin plate mills to the Gary Works is of especial interest to the Western trade. The sheet capacity of this district is to be still further increased by the installation of eight hot mills in the plant of the Inland Steel Company at Indiana Harbor, which now contains 10 hot mills.

Bars.—The continued receipt of heavy steel bar specifications against contracts placed in May and June is making the question of deliveries one of increasing importance. Few, if any, mills are in position to promise shipment inside of 30 days, and some are running even further behind. The Lackawanna Steel Company is not taking any more orders for steel bars. The fact that consumers are pressing for as early delivery as possible on their orders against contracts would indicate that there has been little, if any, speculative buying. Since the requirements of nearly all large consumers have been covered by purchases made some weeks ago, there is not much new business being offered. The demand for bar iron is slowly improving and the market is decidedly firmer. The producing capacity in this district is reduced by the shutdown of the Moline, East Chicago and East St. Louis mills of the Republic Iron & Steel Company, and no announcement has yet been made when they will resume operations. For prompt and nearby deliveries 1.35c., Chicago, is now regarded as the minimum, and on contracts for deliveries running through the remainder of the year 1.40c. is asked.

Merchant Pipe.—Bookings of the leading interest thus far this month are in excess of those for the same period in June, and the indications are favorable for continued improvement. Owing to the gradual filling up of mill capacity, shipments are not coming forward as promptly as they were, but in merchant sizes no serious delay is experienced. The market continues firm and unchanged.

Boiler Tubes.—Trade is quiet, with little increase in demand for merchant tubes. The immediate needs of boiler shops are largely supplied from jobbers' stocks. Beyond the occasional orders received from railroads for repair work there is nothing doing in locomotive tubes.

Cast Iron Pipe.—Last week's lettings included a lot of 600 tons for Fort Meade, Sturgis, S. D., and 200 tons for Springfield, Ohio. Bids will be opened July 27 on 700 tons for Osage, Kan. The United States Cast Iron Pipe & Foundry Company secured 1000 tons of 30-in. pipe required for an intake at Sheboygan, Wis. Prices are somewhat firmer on small pipe, but the scarcity of orders for large pipe invites more active competition. We quote, per net ton, Chicago, as follows: Water pipe, 4 in., \$27.50; 6 to 12 in., \$26.50; 18 in. and up, \$25.50, with \$1 extra for gas pipe.

Metals.—There is little fresh demand for metals and the market is heavy and weaker. During the lively spurt of buying of a month or six weeks ago the larger consumers generally anticipated their requirements and specifications against these purchases constitute the bulk of business now moving. There is a sagging tendency in copper, especially in casting grades. Both lead and spelter are dull and inactive, the former having declined 10c. per 100 lb., with prospects of lower values in the near future. The leading grades of scrap copper have declined 1/4c., and the demand is slow and spiritless. Quotations are as follows: Casting copper, 13 1/2c.; lake, 13 1/2c., in car lots, for prompt shipment; small lots, 1/4c. to 3/4c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.40c. to 4.50c., for 50-ton lots; corroding, 4.65c. to 4.75c., for 50-ton lots in car lots, 2 1/4c. per 100 lb. higher; spelter, 5.35c. to 5.45c.; Cookson's antimony, 10 1/2c., and other grades, 9 1/2c. to 10 1/2c.; sheet zinc is \$7, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 18c.; copper bottoms, 11 1/2c.; copper clips, 12 1/2c.; red brass, 11 1/2c.; yellow brass, 9 1/2c.; light brass, 7c.; lead pipe, 4 1/2c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—The market is extremely quiet and inactive, there being little demand from any source. Transactions of the past week have been mainly limited to small lots required by consumers, and sales of this kind were usually made at prices favorable to the buyer. A distinctive feature of the situation at present is that while small lots can be

picked up at inside prices, no round lots of material are being offered at a bargain. Illustrative of this condition are the following prices received for lots of less than 100 tons on a railroad list closed last week. Frogs, switches and guards, \$14.50; short steel rails, \$15, per gross ton; railroad malleable, \$13; knuckles, couplers and springs, \$13, per net ton. In order to better represent the market classification of scrap, some of the grades now practically obsolete have been dropped and others of more general interest substituted. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails.....	\$17.00 to \$17.50
Old steel rails, rerolling.....	15.25 to 15.75
Old steel rails, less than 3 ft.....	14.50 to 15.00
Relaying rails, standard sections, subject to inspection.....	22.50 to 23.50
Old car wheels.....	16.00 to 16.50
Heavy melting steel scrap.....	14.00 to 14.50
Frogs, switches and guards, cut apart.....	14.00 to 14.50
Mixed steel.....	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$15.00 to \$15.50
Iron car axles.....	18.00 to 18.50
Steel car axles.....	17.25 to 17.75
No. 1 railroad, wrought.....	13.00 to 13.50
No. 2 railroad, wrought.....	12.00 to 12.50
Springs, knuckles and couplers.....	13.00 to 13.50
Locomotive tires, smooth.....	14.75 to 15.25
No. 1 dealers' forge.....	11.00 to 11.50
Steel axle turnings.....	9.50 to 10.00
Machine shop turnings.....	8.00 to 8.25
Cast borings.....	5.75 to 6.25
Mixed borings, &c.....	5.75 to 6.25
No. 1 busheling.....	10.75 to 11.25
No. 2 busheling.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings.....	10.00 to 10.50
No. 1 cast scrap.....	13.50 to 14.00
Stove plate and light cast scrap.....	11.25 to 11.75
Railroad malleable.....	12.50 to 13.00
Agricultural malleable.....	11.25 to 11.75
Pipes and flues.....	9.25 to 9.75

The Domhoff & Joyce Company, with offices in Cincinnati and Chicago, has been appointed exclusive Western sales agent for Globe high silicon silvery iron, produced in Jackson County, Ohio. The territory in which the company has the exclusive sale of this iron comprises Illinois and all west and northwest thereof, western Michigan and northwestern Indiana. The same company has also been appointed exclusive sales agent for Indianapolis by-product foundry coke.

Birmingham.

BIRMINGHAM, ALA., July 11, 1909.

Pig Iron.—The advance in quotations recently effected has been maintained and the attitude manifested by sellers is indicative of a very satisfactory outlook. A disposition to ask higher prices than \$12.50, Birmingham, for No. 2 for last quarter deliveries still prevails, and an advance of 50c. over that basis probably represents the views of a majority of producers. The differential of 50c. per ton on a No. 2 foundry basis for low grades is no longer quoted on grades below No. 3 foundry. The sale of 360 tons of gray forge is reported at \$11.50, Birmingham. Latest records show but few engagements and the aggregate tonnage involved does not compare favorably with the previous report. Such conditions are accounted for largely by the indifference of producers generally as to third quarter commitments and the disposition of the trade to await further developments before entering orders for advanced deliveries at the prices asked. There is no evidence of a disposition to shade quotations for any deliveries except on such grades as are not applicable to specifications in hand. This is true of the merchant interests as well as the producers. The fact that melters do not yet realize an advance in the price of their products commensurate with the increase in the cost of raw material no doubt accounts to some extent for the reluctance in entering into new contracts. In most cases, local melters have received tonnage previously engaged at a rate in excess of anticipations and additional provision for future requirements will of necessity soon result. The melting capacity in this district is about normal and order books in the several lines represent some months' output. Raw material accumulations on founders' yards are more in evidence, but in most cases the surplus results from efforts to provide against any probable shortage at the source of supply.

Cast Iron Pipe.—A contract for some 1500 tons of water pipe for the city of Temple, Texas, is to come up for letting July 15. From 1500 to 2000 tons of water pipe for requirements in Kentucky will be placed on the 15th, and smaller lots for points in other Southern States will probably be entered within 10 days. One of the leading local interests is not solicitous of orders for delivery within three months, and recent competition for such tonnage as offered is indicative of a similar disposition in other directions. Cast iron soil pipe manufacturers report more specifications in hand than at any time since the summer of 1907. All Southern capacity for the manufacture of this material is in operation to some extent, and it is quite probable that better prices will soon be had. Water pipe quotations are unchanged, and we quote, as follows, per net ton, f.o.b. cars

here: 4 to 6 in., \$25; 8 to 12 in., \$24; over 12-in., average \$22 to \$23, with \$1 per ton extra for gas pipe.

Old Material.—Actual transactions recorded indicate but little demand, but repairs to the former largest consumer in this district are being rushed and in other directions there is tangible evidence of a larger consumption very shortly. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron rails.....	\$14.00 to \$14.50
Old iron axles.....	14.50 to 15.00
Old steel axles.....	12.00 to 12.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	10.00 to 10.50
No. 1 country wrought.....	9.50 to 10.00
No. 2 country wrought.....	9.00 to 9.50
No. 1 machinery.....	10.50 to 11.00
Tram car wheels.....	10.50 to 11.00
Standard car wheels.....	12.00 to 12.50
Stove plate and light cast.....	9.00 to 9.50
Cast borings.....	4.50 to 5.00
No. 1 steel.....	10.50 to 11.00

Pittsburgh.

PARK BUILDING, July 15, 1909.—(By Telegraph.)

Pig Iron.—A more active inquiry for pig iron has come up, and there have been some fair sized sales. The Pressed Steel Car Company has bought 3000 tons of malleable Bessemer for delivery over third quarter on the basis of about \$15, Valley furnace, or \$15.90, Pittsburgh. The iron will likely be furnished by local firms identified to some extent with the buyer. Several inquiries for Bessemer iron are in the market for delivery over last half, one from a large steel concern for 25,000 to 30,000 tons. Bessemer iron has advanced squarely to \$15.50; basic is very firm at \$15; malleable is held at \$15 to \$15.25; No. 2 foundry, \$15.25, and gray forge, \$14, all at Valley furnace, the freight rate to the Pittsburgh District being 90c. We note two sales of standard Bessemer iron aggregating 900 tons at \$15.50, Valley furnace; 500 tons of basic and 1200 tons of basic at \$15, Valley furnace; also a sale of 400 tons of No. 2 foundry at \$15.25, Valley furnace.

Steel.—Specifications against contracts on sheet and tin bars are not quite as heavy this month as they were in June, due to the shutdown of a number of sheet and tin mills for inventory and repairs and also because of the strike at the union tin and sheet mills of the American Sheet & Tin Plate Company. Prices on steel are very firm and we quote Bessemer billets at \$23, open hearth at \$23 to \$24, and sheet and tin bars at \$25, minimum, with full freight to delivered point added. Forging billets are firm at \$27, Pittsburgh.

Shafting.—The makers of shafting have harmonized and will hold prices on cold rolled shafting on the basis of 80 per cent. off in carload and larger lots and 55 per cent. off in small lots, delivered in base territory.

(By Mail.)

The great improvement that has taken place in the steel trade in the last four or five months is well shown in the steady increase in live blast furnace capacity since April 1. The United States Steel Corporation, which has a total of 103 blast furnaces, had 61 active on April 1 and 42 idle; 63 were active on May 1 and 40 idle; 79 were active on June 1 and 24 idle, and 85 were active on July 1 and only 18 idle. The other steel interests have also steadily increased their live blast furnace capacity in the last four or five months, thus indicating the heavy enlargement that has taken place in the volume of new business. This increase in active capacity has extended to the finishing mills, and it is safe to say that close to 90 per cent. of the steel melting capacity is active at present. This is a remarkable showing when the fact is remembered that the railroads, the leading consumers of steel, are only buying in small lots and at irregular periods. It is pointed out that if the railroads were buying only 50 per cent. of their normal requirements, the steel mills and manufacturing plants would be simply flooded with business, and would not be able to take care of it and make deliveries wanted. Some of the leading steel mills are now having trouble in making deliveries as promptly as wanted by their customers. The Carnegie Steel Company is getting ready to start its open hearth plant at Sharon, Pa., known as the North Works, and when this is done that company will have only one idle steel plant, which is that located at Columbus, Ohio. While a part of the heavy buying of the past three or four months may have been speculative, due to the low prices ruling in the early part of the year, there is every evidence that most of it is legitimate, and that the material is going into actual consumption. The heavy buying of Northern and Southern pig iron by two or three of the leading consumers has firmed up the market a good deal and prices are very strong. The demand for practically all kinds of finished iron and steel is active, and prices are firm. The scrap market is fairly active, while coke is showing some betterment in demand and prices seem a little firmer.

Ferromanganese.—Two large local interests have been heavy buyers of ferromanganese for delivery up to July 1, 1910, having contracted, it is reported, for over 10,000 tons at prices ranging from \$41 up to \$43, seaboard. Several other consumers are inquiring for small lots. The market

is very firm and we quote 80 per cent. foreign at \$41.50 to \$42, Baltimore, for delivery this year and \$43, Baltimore, for delivery in the first half of next year, the freight to Pittsburgh being \$1.95 a ton.

Ferrosilicon.—This product is strongly held. We quote 50 per cent. at \$61.50 to \$62.50, Pittsburgh, based on the present rate of duty.

Rods.—Few new contracts are being placed for rods, practically all consumers having covered their requirements prior to May 15, when prices were advanced from \$27 to \$29, Pittsburgh. Consumers are specifying quite liberally against these contracts, and shipments by the mills are fairly heavy. We quote Bessemer, open hearth and chain rods at \$29, Pittsburgh.

Muck Bar.—There is little inquiry, and we quote best grades at \$27 to \$27.50, Pittsburgh. The market is firm owing to the higher prices ruling for forge iron.

Skelp.—The active condition of the pipe trade is reflected in skelp, the demand for which is heavier than for some months. The mills have orders representing a good deal of tonnage on their books, especially for sheared plates. Prices are firm and we quote grooved steel skelp at 1.30c. to 1.35c.; sheared, 1.40c. to 1.45c.; grooved iron, 1.50c. to 1.55c., and sheared iron skelp, 1.55c. to 1.60c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—The La Belle Iron Works, Steubenville, Ohio, has bought the plant of the Ohio Rail Company, at Newark, Ohio, and is fixing it up to put it in operation at an early date. The La Belle Iron Works is now in the market for rerolling rails and will roll 8 to 30 lb. sections at this plant. The Ohio Rail Company went into the hands or receivers more than a year ago, at which time the plant was shut down and has remained idle ever since. In the past week the Carnegie Steel Company received new orders and specifications against contracts for about 2000 tons of light rails, but only a few small scattering orders for standard sections have been placed. The market on light rails is very firm and prices have advanced fully \$1 a ton. We quote standard sections at \$28, at mill, and light rails are as follows: 12-lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75; 40 and 45 lb., \$27, all in 250-ton lots, f.o.b. Pittsburgh. Over 250 tons and up to 500 tons, 60c. a ton less, and over 500 tons \$1 a ton less. Splice bars are 1.50c. at mill.

Plates.—Some additional car orders have been placed, and it is stated that some other large contracts are pending. The Chesapeake & Ohio Railroad has placed an order with the American Car & Foundry Company, at Huntington, W. Va., for 1000 steel cars of 300,000 lb. capacity each, and the Carnegie Steel Company will furnish the plates and shapes for these cars, about 12,000 tons. The Buffalo, Rochester & Pittsburgh Railroad has placed an order for 1000 steel cars with the Cambria Steel Company. On August 18 bids will be opened by the Government for the building of two first-class battleships—Arkansas and Wyoming. Each of these boats will require about 11,500 tons of plates, shapes and bars and about 2500 to 3000 tons of armor plate and armament. The general demand for plates from boiler shops and other consumers is showing betterment and the market is very firm. We quote $\frac{1}{4}$ -in. and heavier plates at 1.35c., minimum, for desirable specifications, and 1.40c. on small orders, f.o.b. Pittsburgh.

Structural Material.—Bids will be opened this week by the Jones & Laughlin Steel Company for the steel buildings to contain its new open hearth steel plant at Aliquippa, Pa., which will require about 6000 tons. The American Bridge Company has secured about 1500 tons of bridge work for the Grand Trunk Railroad in Indiana. Some very large contracts for structural steel are pending. The local structural interests are now pretty well filled up for the next two or three months. The absolute minimum on beams and channels up to 15-in. seems to be 1.35c. on desirable orders, and 1.40c. in small lots. Several leading consumers of plates and shapes have recently covered their requirements up to October 1, on the basis of 1.35c., Pittsburgh.

Bars.—Specifications against contracts for steel bars in the latter part of June were very heavy, and in most cases where these contracts expired on July 1 all tonnage not taken out was canceled. The absolute minimum on steel bars to-day is 1.25c., and several leading makers that have a good deal of business on their books are quoting 1.30c., Pittsburgh. A fair amount of new work is coming in, but the mills are running mostly on specifications against contracts. In iron bars the demand is more active than for some time, and shipments by the mills against new orders and contracts are fairly heavy. All the bar iron mills of the Republic Iron & Steel Company are closed down at present for inventory and repairs and pending settlement of the Amalgamated wage scale. We quote steel bars at 1.25c. to 1.30c., and iron bars at 1.45c., f.o.b. at mill, Pittsburgh. High grade iron bars, such as are rolled by the Zug Iron & Steel Company and Lockhart Iron & Steel Company, command about 1.90c. at mill.

Tin Plate.—There are no specially new developments in the matter of the strike among the former union mills of the

American Sheet & Tin Plate Company, and which shut down on July 1 owing to the determination of the company to run these mills on the open shop plan hereafter. It is probable that the first mills to be started will be the Shenango and New Castle works at New Castle, Pa., which have a total of 50 hot mills, and the American Works at Elwood, Ind., which has 28 hot mills. The company has not been seriously embarrassed by the closing down of its tin plate mills, as the demand has fallen off considerably, and it also has large stocks of tin plate on hand, sufficient to meet all demands at present, or until the idle mills have been started. The demand for tin plate is light, as it usually is at this season of the year, and will probably continue so until about October, when canners and other consumers commence to place their contracts. However, the leading tin plate mills have orders for a heavy tonnage on their books and expect to run pretty full during the summer months. The market is firm, and we quote 100-lb. coke plates at \$3.40 per base box, f.o.b. Pittsburgh.

Sheets.—Announcement was made by the American Sheet & Tin Plate Company that it will start up its Struthers Works at Struthers, Ohio, July 19, on the open shop plan. This has been a nonunion plant for a long time, and has been idle for about a year and a half. It contains six hot mills. The only sheet plant of importance belonging to the company that was closed by the strike was the Altna-Standard Works at Bridgeport, Ohio, which has 23 hot mills. This plant is still idle, no attempt having been made to start it. The demand for black and galvanized and roofing sheets is showing much betterment. A gratifying feature of the situation is that practically all cutting in prices has disappeared. Sheet mills, whose contracts for sheet bars have expired, will be compelled to pay the full price of \$25, Pittsburgh, for a new supply of bars, and this has had the tendency of firming up prices on the finished product. We quote one pass box annealed black sheets, No. 28 gauge, at 2.20c., and No. 28, galvanized, at 3.25c., but these prices are being shaded on good orders. The regular price of painted roofing sheets, No. 28, is 1.55c. per square and of galvanized, No. 28, is 2.80c. per square for $2\frac{1}{2}$ -in. corrugations, but these prices are also being shaded.

Hoops and Bands.—A moderate amount of new business is being placed, and concessions in prices are more difficult to obtain, due to the firmness in prices of steel billets and the general improvement in business. We quote steel hoops at 1.50c. and bands at 1.15c., steel card extras on the latter, but these prices are still being shaded to some extent on desirable orders.

Shafting.—The demand is fairly active and the mills are busy on shipments on contracts, against which buyers are specifying freely. Prices on shafting are firmer and we quote it at 60 and 5 to 60 and $7\frac{1}{2}$ off in carload and larger lots, delivered in base territory, while on small lots from 55 to 55 and 5 is being quoted.

Spikes.—Two or three leading railroads are reported in the market for large inquiries for spikes. Prices are firm and we quote at \$1.65 to \$1.70 for $5\frac{1}{2}$ x 9-16 in., and \$1.75 to \$1.80, base, for the smaller sizes, in carloads and larger lots, 5c. per keg additional being charged for less than carloads.

Merchant Pipe.—Conditions in the pipe trade are very satisfactory, the demand being heavy, while prices are well maintained. The inquiry that came out some months ago from the Pure Oil Company for about 400 miles of 8-in. for an oil line in Illinois is reported to be active again. The Hope Natural Gas Company, an interest of the Standard Oil Company, is inquiring for 400 to 500 miles of 6 and 8 in. and larger for a gas line from the West Virginia field to the seaboard. The Wheeling Steel & Iron Company has taken an order for about 30 miles of 6 and 8 in. pipe for the Philadelphia Company, and the same interest has placed a fairly large order for 20-in. pipe with Spang, Chalfant & Co. The Barnsdall interests are buying pipe actively and are placing from 15 to 25 miles every week of miscellaneous sizes. It is reported that a Buffalo, N. Y., oil concern is figuring on 50 to 60 miles of large sizes of iron pipe. Prices of iron pipe are higher, some mills asking 1 point advance or \$2 a ton, and other mills 2 points advance or \$4 a ton. The official discounts on black steel pipe $\frac{1}{4}$ to 6 in. are 81 and 5 and on iron pipe $\frac{1}{4}$ to 6 in., 77 and 5 in carload and larger lots to the largest trade.

Boiler Tubes.—Buying is a little more active, but the amount of new business being placed for locomotive tubes is disappointing. Regular discounts on both merchant and locomotive tubes continues to be more or less shaded.

Iron and Steel Scrap.—Steel scrap of all kinds is being taken up about as fast as offered, and only two items in the whole list that are weak are borings and turnings. Some of the Western bar iron mills, notably those of the Republic Iron & Steel Company, are shut down pending settlement of the wage scales, and this has decreased the consumption of iron scrap to some extent. It is stated that the Pittsburgh Steel Company, whose plant is at Monessen, Pa., is consuming upward of 500 tons of heavy steel scrap per day, being

much the largest consumer of such material in this district. Dealers that have scrap piled up in their yards are inclined to hold it, believing that the market will show an advance in August, or very early in September. About the only scrap that is coming on the market is that offered by the railroads, and some of these have cut down their offerings materially. Dealers quote heavy steel scrap for delivery at the principal consuming points, these being Leechburg, Monessen, Follansbee, Steubenville, Sharon and Pittsburgh, at \$15.75 to \$16, delivered. Cast iron borings are weak and lower, being quoted at \$9.50. There is an active demand for bundled sheet scrap, which is very firm at \$14.50 to \$15, delivered at consuming point. No. 1 cast scrap is held at \$15 to \$15.25; No. 2 \$14.50; sheet bar crop ends, \$16.75 to \$17; No. 1 railroad malleable, \$14.75 to \$15; grate bars, \$12 to \$12.50; No. 1 busheling scrap, \$14 to \$14.25; No. 2, \$12 to \$12.25; low phosphorus melting stock, 0.04 and under, \$19.50 to \$20; rerolling rails, \$16.50; old car wheels, \$16 to \$16.25; locomotive axles, \$25 to \$26; locomotive tires, \$18 to \$18.25; machine shop turnings, \$11.25 to \$11.50; iron axles, \$24.50 to \$25; steel axles, \$20; stove plate, \$11 to \$11.25. These prices are per gross ton, f.o.b. cars, Pittsburgh, unless otherwise stated. We note sales of 1000 to 1200 tons of turnings at about \$11.25, 1500 tons of heavy steel scrap for extended delivery at about \$16, 2000 tons of bundled sheet scrap at about \$14.50 at consuming point, and 500 to 600 tons of borings at \$9.50 to \$9.75, per gross ton.

Coke.—It is now expected that those who have charge of the project of consolidating a number of leading coke plants in the Connellsville region will make a statement of the plants under option and relative to the consummation of the scheme some time this month. It is known that the prices put on their plants by a number of the leading coke operators have been materially scaled down, some of them being cut practically in half. The trade is still skeptical about the success of this project. Consumers of furnace coke are pretty well covered by contracts, and there is not much inquiry, except for a few cars of coke at a time for prompt shipment. We continue to quote standard makes of furnace coke for prompt shipment at about \$1.60 per net ton at oven and \$1.70 to \$1.75 for delivery over last half of the year. Standard makes of 72-hr. foundry coke for spot shipment are held at \$1.80 to \$1.90 per net ton at oven, while on contracts for delivery over the balance of the year from \$2.10 to \$2.50 is being quoted, prices depending largely on the brand of the coke. The output of coke in the two Connellsville regions is fast getting back to normal again; last week it was about 330,000 tons, an increase over the previous week of about 10,000 tons.

Buffalo.

BUFFALO, N. Y., July 13, 1909.

Pig Iron.—The market is quiet, the summer vacation period bringing something of a lull in buying. There has been a fair amount of inquiry, however, and several moderate sized sales have been closed, with an aggregate of about 10,000 tons, mostly foundry grades, under negotiation, from implement makers, railroad and pipe foundries and radiator works tributary to this market. Shipments on contracts are heavy and indications are that they will continue large throughout the summer. Prices are strong and steadily stiffening, owing to the well filled condition of order books. We quote as follows for prompt and last half deliveries, f.o.b. Buffalo:

No. 1 X foundry	.....	\$15.25 to \$15.75
No. 2 X foundry	.....	15.00 to 15.50
No. 2 plain	.....	14.75 to 15.00
No. 3 foundry	.....	14.25 to 14.75
Gray forge	.....	14.25 to 14.50
Malleable Bessemer	.....	15.00 to 15.50
Basic	.....	15.50 to 16.00
Charcoal	.....	19.50 to 20.00

Finished Iron and Steel.—The Jones & Laughlin Steel Company, the Lackawanna Steel Company and other independent interests have advanced prices on bars to 1.30c., base, Pittsburgh, and on small shapes and on plates to 1.40c., base, Pittsburgh. One of the leading producers was tendered last week an order for 5000 tons of bar material for export shipment on the basis of 1.20c., specifications to be taken before September 1, but the offer was declined. The demand for bars and plates, although fair, is slackening somewhat, evidently feeling the effects of the midsummer vacation season. Specifications drawn on the mills are still heavy, however, which insures great activity in production during the entire summer. In structural lines there is no let up in inquiry; several building projects are developing, which will soon be ready for bids. The American Bridge Company has secured contract for the steel for the new tank, truck and paint shop, 185 x 825 ft., which the American Locomotive Company is to add to its Brooks plant at Dunkirk, involving a large tonnage, and the Charles F. Ernst Sons Iron Works has taken contract for steel for the St. Mary's Lyceum Building, Broadway, Buffalo, about 100 tons.

Old Material.—The market is rather quiet, the demand from consumers, except on contract, being largely suspended

until after the completion of inventories, current business being in small lots only. Prices are firmly held, however, as dealers anticipate a large business a little later on. We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel scrap	\$14.75 to \$15.25
Low phosphorus steel scrap	18.50 to 19.00
No. 1 railroad wrought	15.50 to 16.00
No. 1 railroad and machinery cast scrap	14.75 to 15.00
Old steel axles	19.00 to 19.50
Old iron axles	21.25 to 21.75
Old car wheels	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Boiler plate	12.75 to 13.25
Locomotive grate bars	12.00 to 12.25
Pipe	12.25 to 12.75
Wrought iron and soft steel turnings	9.00 to 9.50
Clean cast iron borings	7.50 to 8.00
No. 1 busheling scrap	13.00 to 13.50
No. 2 busheling scrap	11.00 to 11.50

Philadelphia.

PHILADELPHIA, PA., July 13, 1909.

While the customary midyear dullness is to be noted in some directions, the demand, considering the season, has been comparatively good. Plates and structural shapes particularly show continued activity, and mills in this territory are steadily increasing their production, in several instances finishing departments running at full capacity. Crude materials show seasonable quietness, but sellers are in a strong position and prices are very firm. The general tendency of the market on the whole is upward; the demand is increasing slowly and the undertone is strong. Crop reports are favorable, and with the disposal of the tariff question, which is expected in the near future, conditions will, it is believed, shape themselves for general betterment, and normal conditions early in the fall are predicted by many in the trade.

Pig Iron.—Transactions have been on a small scale individually, and sales have been confined largely to the foundry grades, which have been taken for delivery during the third quarter. The buying has been principally by the smaller consumers, who, in a majority of cases, pay top prices. Sellers here are in a comparatively strong position; in the majority of cases order books are pretty well filled as far as third quarter deliveries are concerned, and several sellers have practically withdrawn from the market. Stocks on furnace banks are decreasing steadily, and in several instances the tonnage in furnace yards is practically nil. Consumption is increasing slowly, and many melters are urging deliveries on iron previously purchased. This is more noticeable, however, on the part of the steel works than on that of the iron foundries. Prices generally are very firm, and in instances higher quotations are being named. The basis of \$16, at furnace, for standard No. 2X foundry, is being firmly adhered to by practically all sellers here, equal to \$16.50 to \$16.75, delivered, according to the freight rate, although some few who have little iron for sale quote higher figures, and one seller has placed No. 2 plain for third quarter shipment on the same basis as No. 2, at the furnace. While there is still a strong demand coming from the cast iron pipe foundries for low grade iron, these grades are scarce, and business has been refused by certain sellers at an advance of 25 cents a ton over prices recently ruling. There has been a fair movement of Virginia foundry iron, for comparatively early shipment, at prices ranging from \$13.75 to \$14, furnace, for No. 2X. Several round tonnages of low grade iron for local consumption have also been disposed of. But little movement of Southern iron is noted, the recent advance in prices checking transactions here to a large extent. The demand for forge iron for rolling mill purposes is quiet. Not much interest is being shown for this grade, and transactions have been on a small scale, with prices firm. Several of the steel mills have again been feeling the market for basic iron, and it is understood that one sale of a moderate lot has been made at \$15.50, delivered. Sellers in the majority of cases have marked up the asking price for this grade, quotations ranging from \$15.50 to \$16, although \$15.50 to \$15.75 about represents the market, with few sellers at the low level. The demand for low phosphorus in this territory is quiet, one sale of 2000 tons or 0.03 iron for New England being reported at a price equal to \$20, delivered here. Prices are strong for all grades, the following range being named for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points, during the third quarter.

Eastern Pennsylvania, No. 2 X foundry	\$16.50 to \$16.75
Eastern Pennsylvania, No. 2 plain	16.00 to 16.25
Virginia, No. 2 X foundry	16.50 to 17.00
Virginia, No. 2 plain	16.25 to 16.75
Gray forge	15.25 to 15.50
Basic	15.50 to 15.75
Low phosphorus	19.50 to 20.00

Ferromanganese.—Little movement is noted in this territory, as buyers, as far as immediate needs are concerned, are pretty well covered. Some inquiry from Western consumers is reported, and prices are not quite as firm as they were. For the balance of this year quotations range from

\$41 to \$42, f.o.b. Baltimore. For delivery during the first half of next year, \$42.50 to \$43.50 is named.

Billets.—There has been more inquiry for rolling billets, some consumers being in the market for several thousand tons. Sellers, however, have stiffened up somewhat and refuse to accept heavy tonnages or contracts for extended delivery at current quotations, which, on ordinary rolling billets, for prompt shipment, range from \$25 to \$25.50 at nearby mill, with full freight added, to point of delivery. Forging billets taking the usual \$2 a ton advance, and the customary extras for high carbons and special sizes.

Plates.—Quite a satisfactory tonnage continues to come out and mills are now running at pretty close to full capacity in their finishing departments. Melting capacity, however, has not yet reached normal, but if the present volume of business continues it will not be long before the idle open hearth furnaces will be put into operation. Orders recently have been of a more general nature, although those for railroad work, both direct and indirect, predominate. Mills are not anxious to contract at the present state of the market, and while 1.45c. to 1.55c. continues to be firmly maintained for ordinary plates for prompt delivery, some sellers have advanced prices \$2 a ton, for delivery extending through the fourth quarter.

Structural Material.—The demand is well maintained. The Philadelphia & Reading has placed its order for 4500 tons of bridge work for the Ninth street elevated with the American Bridge Company and is now completing plans for the elevation of its Port Richmond branch. The city of Philadelphia is asking for bids for the erection of four plate girder bridges, estimated to cost about \$125,000. Several other moderate sized propositions are pending, while miscellaneous business of fairly good proportions continues to be transacted. Prices are very firm, quotations for plain material ranging from 1.45c. to 1.55c., delivered, according to specification.

Sheets.—There has been a somewhat better demand, but orders as a rule are small and for comparatively early delivery. Little inquiry for large tonnages for extended delivery is to be noted. The local mills have, for the most part, resumed operations, although they will not reach full capacity for at least a week. Prices are being well maintained, ranging as follows for prompt lots for delivery in this vicinity: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—Current business has been confined to small lots for reasonably prompt shipment at unchanged prices. There is a tendency toward somewhat higher prices, although there is no concerted action in that direction. Refined iron bars are quoted by the leading producers at 1.35c. to 1.40c., mill, equal to 1.45c. to 1.50c., delivered. Steel bars are fairly active at 1.40c. to 1.45c., delivered, but we understand that extensions of orders at current prices are being restricted by some sellers.

Coke.—Sales have been light and confined largely to foundry coke. Prices are firmer, and in some instances have been slightly advanced. Ovens are being more extensively operated, and there is less disposition on the part of sellers to force business. For delivery in this territory the following range of prices is quoted, dependent on brand and tonnage:

Connellsburg furnace coke	\$3.90 to \$4.10
Foundry coke	4.35 to 4.50
Mountain furnace coke	3.50 to 3.70
Foundry coke	3.80 to 4.10

Old Material.—The market shows some irregularity. Steel scrap is decidedly strong, while rolling mill grades, except in certain specialties, are somewhat weaker. Heavy melting steel has been taken in moderate lots at \$16, delivered, and some sellers now refuse to sell any large tonnage at that figure. On the ordinary rolling mill grades there is less spread in prices than is usually the case, buyers offering about the same price for carload lots as they do for large tonnage; the bulk of the sales, however, have been small, and in some instances at slightly lower figures. Quotations, while nominal to some extent, range about as follows, for deliveries in buyers' yard, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	\$16.00 to \$16.50
Low phosphorus	20.00 to 20.50
Old steel axles	21.50 to 22.00
Old iron axles	23.25 to 24.00
Old iron rails	19.50 to 20.50
Old car wheels	14.75 to 15.25
Chloe No. 1 R. R. wrought	17.25 to 17.75
Machinery cast	14.75 to 15.25
Railroad malleable	14.50 to 15.00
Wrought iron pipe	15.50 to 16.00
No. 1 forge fire scrap	14.00 to 14.50
No. 2 light iron	9.50 to 10.00
Wrought turnings	12.25 to 12.75
Stove plate	12.50 to 13.50
Cast borings	10.00 to 10.50
Grate bars	13.50 to 13.75

By decree published in the *Diario Oficial*, the importation of machinery, implements and material for the prospecting and exploitation of mines and the installation of metallurgical works in Uruguay is made free of duty for a period of 10 years.

Cleveland.

CLEVELAND, OHIO, July 13, 1909.

Iron Ore.—The market is rather quiet, although some tonnage was sold during the week. The improvement in the pig iron market is expected soon to stimulate the ore market. Although a fair tonnage has already been sold, a number of furnace interests have as yet bought nothing and others have covered only a portion of their requirements. Some of the ore companies are pretty well sold up on Bessemer ores. The ore movement down the lakes is fairly heavy, having increased since the first of the month. The Steel Corporation has put a number of its smaller boats in commission in the ore trade. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old Range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—Not a large tonnage has been sold during the week, but a good number of inquiries for foundry iron, ranging from 200 to 300 to 1000 tons lots and over, have developed, and indications point to a fairly good buying movement. Inquiries are plentiful both from this district and from adjacent territory. Some of the inquiries are for delivery during the first quarter and first half of 1910 and a limited tonnage has been sold for delivery after the first of the year, although some furnace interests are refusing to quote prices that far ahead. Local prices are slightly firmer, furnaces not being disposed to quote under \$15.75, delivered, Cleveland, for No. 2 for the balance of the year. We note two sales by local furnaces to Cleveland consumers during the week, one of 1000 tons and another of 1250 tons, at \$15.50, delivered, for No. 2 for the balance of the year. For outside shipment local furnaces are quoting a minimum price of \$15, at furnace, for No. 2. In the Valley the price still ranges from \$15 to \$15.25, although some furnaces are holding for \$15.50 and higher. For first quarter and first half delivery furnaces are asking from \$15.50 to \$16 for No. 2, and a few sales have been made at \$15.50 to \$15.75 for outside shipment. A local interest has sold a round tonnage of basic to the International Harvester Company for last half delivery. Among the inquiries pending for foundry iron is one from a Mansfield pump manufacturer for 1000 tons for the last half; one from a Canton radiator manufacturer for several hundred tons for the first half, and several from implement manufacturers and other consumers in Indiana and Michigan for lots ranging from 500 to 2000 tons. A Youngstown consumer has an inquiry out for 1800 tons of ferromanganese for prompt shipment and first half. A leading Southern maker has advanced its price on Southern iron to \$18, Birmingham, for the last quarter. We quote, delivered, Cleveland, for the last half, as follows:

Bessemer	\$16.15 to \$16.40
Northern foundry, No. 1	16.00 to 16.40
Northern foundry, No. 2	15.50 to 15.90
Northern foundry, No. 3	15.00 to 15.40
Southern foundry, No. 2	16.60 to 17.10
Gray forge	14.50 to 15.00
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—The demand for foundry coke shows some improvement. A number of contracts were made during the week at \$2 per net ton for 72-hr. standard foundry coke for the balance of the year, and \$2.25 for delivery until July 1, 1910. Spot foundry coke is held at \$1.80 to \$2. Reports from the coke regions indicate a scarcity of labor. Producers are looking for better prices soon. We quote standard Connellsville furnace coke at \$1.70 to \$1.75 at oven, on contract for the balance of the year and \$1.80 for spot shipment.

Finished Iron and Steel.—Although specifications on contracts are not as heavy as late in June, a good volume of orders has come out. One or two of the independent mills report that they are now in a little better shape on some deliveries, but the general situation in this regard shows little change, and some of the mills are not eager to take on additional tonnage at the present time. The volume of new business is still light, but is increasing, and inquiries are now fairly plentiful, being largely for steel bars. The demand for structural material continues very good and fabricating plants are well filled with small work. Structural consumers, however, are nearly all under contract, and little new business is coming out, although there is an inquiry from a northern Ohio boiler shop for 1000 tons of shapes. A leading independent producer has advanced its price on steel bars to 1.30c., Pittsburgh, and on plates and shapes to 1.40c., Pittsburgh. The only new building project in sight here that will require a round tonnage of structural material is the Cleveland Athletic Club, about 1300 tons, for which bids will probably be received next month. The demand for iron bars has improved, some new business coming from railroads and car builders. Some contracts have been closed at 1.45c., for delivery until the end of the year. Local mills have advanced the price of iron bars \$1 a ton to 1.50c., Cleveland, and a leading producer has made a similar advance and is now quoting that price, Pittsburgh. Local bolt manufacturers report considerable improvement in orders, having received some good railroad orders since July 1. Orders and inquiries for light rails in lots ranging from carloads to 100 tons are more plentiful from coal and ore mining companies, and

prices are being well maintained. The demand for plates is fairly good and prices are being well maintained. The demand for sheets is improving, particularly for blue annealed sheets, and prices are firmer. Jobbers report an improvement in warehouse business over June, which was their best month in nearly two years. Owing to the delay in deliveries by mills, consumers who want quick deliveries are placing large stock orders for steel bars. Jobbers have advanced their warehouse price on steel bars \$2 a ton to 1.60c., and have also made a \$2 advance on blue annealed sheets.

Old Material.—The market is very dull, and the absence of a demand has resulted in a weakening in prices. While nominal quotations remain about stationary dealers would have to make concessions of 25c. to 50c. a ton on most grades to move scrap at the present time. Heavy melting steel is weaker for local delivery than for outside shipment, \$14 per gross ton being all the local mills are willing to pay. Some mills are taking scrap freely on contract, but others are holding up shipments as much as possible. There is little trading among dealers. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	\$15.00 to \$15.50
Old iron rails	16.50 to 17.00
Steel car axles	19.00 to 19.50
Old car wheels	15.00 to 15.50
Heavy melting steel	14.00 to 14.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	12.50 to 13.00
Railroad malleable	14.00
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$17.50 to \$18.00
Cast borings	6.50 to 7.00
Iron and steel turnings and drillings	8.50 to 9.00
Steel axle turnings	10.00 to 10.50
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	13.50 to 14.00
No. 1 cast	12.50 to 13.00
Stove plate	10.50 to 11.00
Bundled tin scrap	10.00 to 10.50

Cincinnati.

CINCINNATI, OHIO, July 14, 1909.—(By Telegraph.)

In steel lines the market shows an extremely healthy condition with a stiffening tendency through the entire list. Specifications against contracts are in the main heavy and sales from stock are good. Pig iron looks promising enough to some large consumers to bring out inquiries for 1910 prices, in response to circular letters from the trade. The foundry melt is increasing gradually. Old material has developed no strength, but is really weaker.

Pig Iron.—The market is unchanged, save that some irons have advanced the fourth quarter price, and one standard Northern producer who has always been a trifle stiffer is willing to accept the flat price of \$14.50, Ironton, for last half business. Little or no attention will be given the feelers from melters for next year prices, for the reason that the furnaceman with books in good shape for this year is possessed of the same speculative spirit that actuates the customer and will await developments. A northeastern Ohio manufacturer of agricultural implements, conspicuous among 1910 inquirers, was quoted for first half or quarter on a basis of \$15.50 for No. 2 by a nearby furnace interest. So far as can be ascertained, no Southern interest is willing to quote on next year. The universally quoted price of \$12.50, Birmingham, on No. 2 by Southern furnaces last week was firmly maintained, although some resale iron acquired by scrap dealers on speculation at around \$11 was sold in southern Ohio on the basis of \$12.25. A stove manufacturer in northern Ohio is asking prices on 700 or 800 tons of foundry iron; another manufacturing interest in the same district on 500 tons for the last half; a southern Indiana structural concern on 200 tons of Southern, Nos. 2 and 3, for the last quarter. Miscellaneous jobbing foundry interests are taking small lots of a few hundred tons. The stiffening in price of Southern iron has had the tendency to stimulate shipments on contracts, and few hold-ups are reported. The feeling here is for a fairly steady market through July and August, with a firm \$13 market for Southern and \$14.50 for Northern for last quarter. Low grades are still scarce and surplus stocks seem to have been exhausted. For prompt shipment and third quarter, based on freight rates of \$3.25 from Birmingham and \$1.20 from Hanging Rock, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	\$16.25
Southern coke, No. 2 foundry	15.75
Southern coke, No. 3 foundry	\$15.00 to 15.25
Southern coke, No. 4 foundry	14.25 to 14.75
Southern coke, No. 1 soft	16.25
Southern coke, No. 2 soft	15.75
Southern coke, gray forge	14.00 to 14.25
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	15.95 to 16.20
Lake Superior coke, No. 2	15.70
Lake Superior coke, No. 3	14.95 to 15.20
Standard Southern ear wheel	22.25 to 23.75
Lake Superior car wheel	20.50 to 21.00

(By Mail.)

Coke.—Reports indicate that producers in the Connellsville and West Virginia fields are having some trouble with

labor, and that in sentiment with iron the feeling is for a stronger market ere the close of the third quarter. Prices are unchanged from last week. Foundrymen are buying to take care of the increasing melt, and the price is from \$2 to \$2.25 on contract for standard brands.

Finished Iron and Steel.—There is some small buying from dealers at the advanced prices, but there appears to be some irregularity in quotations, particularly on steel bars. The largest interest is credited with shading the quoted price more liberally than some of the larger independents, the best obtainable among which seems to be \$1.25, Pittsburgh. The majority of these announce themselves sold up to November, and others through the entire year. In iron bars there are a variety of prices; some of the smaller mills in this territory are accredited with taking occasional modest tonnages at better than 1.35c., Pittsburgh. Sheets are firmer—that is, there is a stricter adherence to the quoted price which has been liberally shaded, and the feeling is for a strong fourth quarter market. The Newport Rolling Mill has just started up its entire 10 hot mills this morning, and expects to continue without interruption the remainder of the year. Business with this concern is reported to be quite good in the South and Southwest. The demand is increasing for black and galvanized sheets, and these are quoted here: Black, No. 28, 2.25c.; galvanized, No. 28, 3.25c. The statement is made that comparatively little evidence of shading is presented since the first of the month.

Twisted Steel Bars.—This section being the seat of large concrete construction, twisted steel bars are a strong factor in the material markets. The mill price for this work is as follows: Bars $\frac{3}{8}$ to $\frac{3}{4}$ in., 10c. added to the base delivered price; bars $\frac{3}{4}$ in. and larger, 5c. A heavy tonnage of these will be required for the new Ohio Mechanics' Institute Building, on which bids are now being asked by Samuel Hannaford & Sons, architects. Bids are to be in by July 28.

Old Material.—There is little activity in the local scrap market, and not much is expected before fall. Dealers are busy taking stock. The local bar mills have filled up for some time, as have also the steel mills, the largest one having an immense tonnage on its yards bought during the early summer slump. Considerable scrap is being shipped out on contract, and stocks will show much lighter than at the close of the second quarter. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. wrought, net ton.....	\$13.50 to \$14.50
Cast borings, net ton.....	6.00 to 7.00
Heavy melting steel scrap, gross ton.....	13.00 to 14.00
Steel turnings, net ton.....	8.50 to 9.50
No. 1 cast scrap, net ton.....	13.00 to 14.00
Burnt scrap, net ton.....	9.50 to 10.50
Old iron axles, net ton.....	17.50 to 18.00
Old iron rails, gross ton.....	15.00 to 15.50
Old steel rails, short, gross ton.....	13.50 to 14.00
Old steel rails, long, gross ton.....	13.50 to 14.00
Relaying rails, 56 lb. and up, gross ton.....	21.50 to 22.00
Old car wheels, gross ton.....	14.50 to 15.00
Low phosphorus scrap, gross ton.....	13.50 to 14.00

St. Louis.

ST. LOUIS, Mo., July 12, 1909.

While in some lines a seasonable degree of inactivity now prevails, on the other hand where normal conditions make for activity, such, for instance, as building operations and railroad work, a very satisfactory showing is being reported. The daily clearings at the local banks are heavy, and the banks are well stocked with funds. The iron trade is in good shape, and the demand for metals is large and increasing in volume. Houses dealing principally with railroads report an excellent demand from that source. Crop prospects are favorable in this section. There is a very general disposition to make preparations for taking care of a heavy fall trade in all staple lines.

Coke.—The marked activity for the past few weeks in the iron trade has helped the coke market both in demand and price. The feature at present, however, is rather toward furnishing requisitions on contract than in new buying, though the demand is fairly good. The market is quoted at \$2.15 to \$2.40, at oven, for 72-hr. Connellsburg foundry, standard brands, the higher figure being asked for forward delivery.

Pig Iron.—With the larger buyers temporarily out of the market, owing to the heavy commitments of the past few weeks, current business is mainly with country foundries. The houses catering to this trade state that the demand is keeping up well, and report inquiries during the week ending July 10 for lots ranging from 200 to 600 tons. It is acknowledged, however, that the rapid advance, together with the strong views of Southern producers for shipment over the last quarter, has operated to check the demand. With the larger buyers the belief that there has been quite heavy speculative buying, and that this iron is liable at any time to be put on the market to a greater or less extent, tends to conservatism. The consensus of opinion among the leading brokers is that present conditions should be regarded as normal and healthy, and that the market should be allowed

to adjust itself. In the long run, slow and sure is the safest course. Regarding inquiries, the largest pending is for not exceeding 5000 tons of basic for shipment over the latter part of the year. Another house reports inquiries for 500 tons of Southern iron for last quarter and 800 tons of Northern iron for the first half of 1910; also 400 tons of Southern for the first quarter of 1910. Sales for June were heavy with most agencies and a gratifying number of requisitions is coming in. The market is quoted at \$12.50 to \$13, Birmingham, for Southern No. 2 foundry, the higher figure being for shipment over the last quarter. No prices are being made for 1910. Some of the leading sellers state that they are notified that prices will not for the present be named for the last quarter, and it is quite evident that Southern melters are quite strong in their views, anticipating a further appreciation in prices during the fall. To offset this are the speculative situation referred to, the fact that in the country some foundries are not busy, and the knowledge that Southern iron has advanced more in price than Northern. Clifton manganese is held at \$13.25 to \$13.50, at furnace, for third and fourth quarter shipment, respectively.

Finished Iron and Steel.—For structural material there is a limited demand, principally from fabricators. The best inquiry is coming from country territory. There is a marked improvement in the demand from railroads for all classes of supplies—better than for a year and a half, with the prospect of a further increase.

Old Materials.—The situation in scrap iron and steel is not easily reported, since it is viewed in different lights by some of the leading holders. Plainly stated, it may be said that old material is being dealt in more or less on a speculative basis, the commitments of a dealer, the amount and character, as to kind of his stock, together with its position, whether yarded or a recent purchase—all these considerations are bound to be taken into account. At present consumers are not actively in the market except for some special lines; consequently quotations are more or less nominal. It is proper to state that to move large lots for immediate delivery, a greater concession would be demanded than the dealers would be willing to accept; therefore most of the trading for the moment is between dealers. It is not a wholly satisfactory condition to the holders, but they seem to believe in an improvement later on through the revival going on in general business. The offerings by the railroads are as follows: San Francisco, 1000 tons; Wabash, 900 tons; Vandalia, 150 tons. The following prices are per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$15.00 to \$15.50
Old steel rails, rerolling.....	15.00 to 15.50
Old steel rails, less than 3 ft.....	14.50 to 15.00
Relaying rails, standard sections, subject to inspection.....	23.00 to 24.00
Old car wheels.....	14.50 to 15.00
Heavy melting steel scrap.....	14.50 to 15.00
Frogs, switches and guards, cut apart.....	14.50 to 15.00

The following quotations are per net ton:

Iron fish plates.....	\$13.25 to \$14.25
Iron car axles.....	18.50 to 19.00
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	12.50 to 13.00
Railway springs.....	12.50 to 13.00
Locomotive tires, smooth.....	12.50 to 13.00
No. 1 dealers' forge.....	9.50 to 10.00
Mixed borings.....	5.75 to 6.25
No. 1 boilers, cut to sheets and rings.....	9.50 to 10.00
No. 1 cast scrap.....	12.50 to 13.00
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	12.50 to 13.00
Agricultural malleable.....	11.50 to 12.00
Pipes and flues.....	9.50 to 10.00
Railroad sheet scrap.....	8.50 to 9.50
Railroad grate bars.....	9.50 to 10.00
Machine shop turnings.....	8.00 to 8.50

Lead, Spelter, Etc.—Lead is in fair demand at 4.27 $\frac{1}{2}$ c. There is a quiet, featureless market for lead ore at \$26 per 1000 lb., Joplin base. Spelter is in good demand, and held at 5.27 $\frac{1}{2}$ c. Zinc ore is firm at \$45 per ton, Joplin. Tin is up $\frac{1}{4}$ c.; antimony unchanged; copper ruling at last week's quotation. The demand for metals for the week ending July 10 was brisk, mainly for prompt shipment.

C. W. Hudson of the Hoyt Metal Company has returned from Europe, and B. S. Thompson, secretary of the same company, has just left St. Louis for a trip abroad.

T. L. Powell, with Hickman, Williams & Co., has been transferred from their St. Louis office to become manager of their Birmingham office. The Cal Hirsch & Sons Iron & Rail Company has removed to 1828 Locust street.

The city of St. Louis is advertising for proposals for furnishing all materials, tools and labor necessary for the river and shore piers of the Municipal Bridge over the Mississippi River at St. Louis. The deposit required is \$13,225.

An international aeronautical exposition opened July 10 at Frankfort-on-the-Main, Germany, to continue 100 days. All types of balloons, dirigibles, triplanes, biplanes and gliders which have been in the public eye for the last few years are on exhibition, either in the original or by means of models.

New York.

NEW YORK, July 14, 1909.

Pig Iron.—Some very fair orders for foundry iron have been placed in this vicinity and in New England, and several round blocks have been taken by pipe makers. The fact is noted that buyers who were supposed to have covered third quarter requirements earlier in the year are coming into the market for additional quantities, thus indicating that the melt is increasing. We quote \$17 to \$17.25 for No. 1 Northern foundry, \$16.50 to \$16.75 for No. 2 foundry and \$15.75 to \$16 for No. 2 plain. Alabama iron is quoted \$17 to \$17.50 for No. 1 foundry and \$16.50 to \$16.75 for No. 2 foundry.

Steel Rails.—Of the New Haven order there was awarded 3600 tons to the Pennsylvania Steel Company and 5500 tons to the Bethlehem Steel Company.

Structural Material.—The market has been moderately active, the largest order placed being 2000 tons of bridge work for the Lehigh Valley to the Phoenix Iron Company. Among the other orders placed were 1000 tons for an Omaha theatre, 1550 tons for track elevation on the Pennsylvania lines West, 600 tons for the Pere Marquette, 800 tons for the Missouri, Kansas & Texas and a small lot for a terminal at St. Louis. We quote plain material, mill shipments, delivered at tidewater, 1.51c. to 1.57c., for sizes up to 15 in.

Ferroalloys.—Ferromanganese is in fair demand, judging from the inquiries, and some sellers are demanding more than \$42 for immediate delivery. It can be had, however, at that price, and \$43 is quoted for next year. Ferrosilicon is fairly plentiful, and no large transactions have been reported. A fair sized sale was made during the week to Philadelphia parties at \$62, and that is the reigning price.

Bars.—Manufacturers report a fair business in bar iron at 1.45c. to 1.50c., tidewater, and in steel bars at 1.41c. to 1.46c., tidewater.

Plates.—Better reports are coming from the mills as to their increasing activity, but they are getting little work from this locality at present.

Cast Iron Pipe.—While inquiries for small lots are fairly numerous, no lettings of any considerable size are now in sight in this immediate district. The city of New York will ask for contractors' bids this week, involving the use of a few hundred tons of pipe. It is possible, however, that if the recommendations of the officials of the Water Department are complied with, quite a large amount of work may be undertaken some time this summer or fall which will call for rather large quantities. Competition is again becoming sharp for all business now making its appearance and prices are not as strong as they were. Carload lots of 6-in. can be had at \$23, tidewater.

Old Material.—Transactions are reported in heavy melting steel scrap which aggregate a fairly heavy quantity, considering the fact that this is midsummer and general conditions tend to quietness. The prices realized were somewhat better than the recent course of the market would indicate. While in other lines the old material market is inactive, dealers are maintaining a firm front, believing that the strength of the market on new products will shortly be felt in a heavier demand for old material. Quotations are approximately as follows, per gross ton, for delivery in New York and vicinity:

Old girder and T-rails for melting	....	\$12.00 to \$12.50
Heavy melting steel scrap	....	12.00 to 12.50
Relaying rails	....	20.00 to 20.50
Standard hammered iron car axles	....	19.00 to 19.50
Old steel car axles	....	17.50 to 18.00
No. 1 railroad wrought	....	14.50 to 15.00
Iron track scrap	....	13.00 to 14.00
No. 1 yard wrought, long	....	13.50 to 14.00
No. 1 yard wrought, short	....	12.50 to 13.00
Light iron	....	8.00 to 8.50
Cast bordin	....	8.25 to 8.75
Wrought turnings	....	9.50 to 10.00
Wrought pipe	....	12.00 to 12.50
Old car wheels	....	14.50 to 15.00
No. 1 heavy cast, broken up	....	18.00 to 18.50
Stove plate	....	11.50 to 12.00
Locomotive grate bars	....	10.50 to 11.00
Malleable cast	....	14.00 to 14.50

The Irondale Steel Company announces that it is about to establish coke ovens at or near its coal properties in Ashford, Pierce County, some distance south from Seattle; the company has 2000 acres of coal lands in this vicinity. The president, James A. Moore, says that 10,000 tons of first class hematite ore have already been taken from the mines at Arlington, Snohomish County, and delivered at the Irondale plant, and that a large quantity is ready to come from the mines on Vancouver Island, British Columbia. R. A. McLellan has been appointed chief engineer of the corporation and has gone to Philadelphia to complete arrangements for having two of the engines for the plant built and delivered here in August. Mr. McLellan 10 years ago went from

San Francisco to Korea for a large construction company, and spent eight years in the Orient before returning, superintending a large part of the electrical construction carried on in Korea during that period.

Metal Market.

NEW YORK, July 14, 1909.

Copper.—Most of the heavy sellers of copper have withdrawn from the market and even those who have the metal on hand are not over anxious to sell at the prices offered by consumers. The latter are looking for bargains only, and with the London market equally listless the copper situation is more or less featureless. It is generally conceded that electrolytic can be had in fairly large quantities for 13c., and the recent sale of a fair sized quantity on the floor of the Metal Exchange at that price seems to have established that quotation. Lake copper may be had for 13.12 $\frac{1}{2}$ c., and those who are offering it find the market weak. The trade is discussing the agitation over the Metal Exchange methods and in that connection it might be interesting to know that authoritative information is given to the effect that the Exchange will probably shortly decide to trade in standard copper on the floor, similar to the methods employed in the London market. The statistics of the Copper Producers' Association announced on July 9 are favorable, showing a heavy reduction in the stock of marketable copper of all kinds on hand at all points in the United States. L. Vogelstein & Co. give the following figures of German consumption of foreign copper from the month of January to May, 1909: Imports of copper, 65,956 tons; exports of copper, 2648 tons; consumption of copper, 63,308 tons, as compared with consumption during the same period in 1908 of 68,893 tons. Of the above quantity, 60,353 tons were imported from the United States. The London market is listless and the price established for to-day was £57 17s 6d for spot and £58 12s 6d for futures, and the market was steady. The exports of copper so far this month have been 13,655 tons.

Pig Tin.—For the first time in several weeks pig tin has been quoted at less than 29c., but regardless of this fact there is a steady buying in small quantities, and to-day the market took on a more cheerful tone than it has had for the last week. There has been no big day during the week, but a little buying has been done every day. The approaching Banca sale on July 29 is attracting more interest than the sales usually do in the trade, chiefly because of the absence of other topics for discussion. An offering of 2000 tons of tin will be made at the sale, and there is much speculation as to the price it will bring, taking into consideration the dullness of the London market, which in keeping with the situation here is a hesitating market with little bidding for futures. Prices established during the week were:

	Cents.
July 7	28.99
July 8	28.90
July 9	29.10
July 12	29.00
July 13	28.90

Early this afternoon the market took on a more cheerful tone, and sales were reported at 29.05c. In London to-day the tin market was reported firm, and the prices established were £131 12s. 6d. for spot and £133 1s. for futures. The sales were spot 190 tons and futures 520 tons.

Lead.—A number of consumers who bought lead some time ago at lower prices than have been established the last few weeks, and who have no use for the metal at present have come into the market as sellers with the idea of turning their holdings over at a profit, and this has weakened the market to such an extent that the outside interests are now quoting the American Smelting & Refining Company's price of 4.35c. There have been reports of offers at 4.32 $\frac{1}{2}$ c., and the Metal Exchange is quoting that as the bid price. Some of the consumers' metal has been offered in St. Louis, and it is the opinion of many in the trade that little can be bought there for 4.20c., although the big interests continue to ask 4.25c. It is not thought that this weakness will continue, as it is expected that consumers' holdings will shortly be taken up. The London market to-day was £12 11s. 3d., which is 5 shillings lower than the price established this day last week.

Spelter.—A very dull market prevails, but prices are fairly firm and 5.35c. is invariably quoted.

Antimony.—A scarcity of Cookson's antimony has raised the price to 8.50c., but Hallett's, which is more plentiful, can still be had at 7.50c., the price quoted last week, although it is naturally selling more freely. The steamer Idaho, which was expected to arrive here from Hull on July 10 with a cargo of Cookson's on board, was delayed in sailing and is not expected here now until the end of the month, which is the chief reason for the raise in price of that brand, and one buyer who desired a fair sized lot was obliged to shop around considerably before he obtained what he needed for that money.

Tin Plate.—The threatened coal miners' strike is attracting the attention of the trade, but there is so little demand for

tin plate that it has not affected the price to any extent. For 100-lb. 1C coke plates, 3.64c., New York, is generally asked, and there may be a little shading.

Old Metals.—The following dealers' selling prices represent the New York market:

	Cents.
Copper, heavy cut and crucible	12.62½ to 12.75
Copper, heavy and wire	12.37½ to 12.62½
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.00 to 9.25
Brass, light	7.25 to 7.50
Heavy machine composition	11.50 to 11.75
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 10.00
Lead, heavy	4.15 to 4.20
Lead, tea	3.85 to 3.90
Zinc scrap	3.62½ to 3.87½

Iron and Industrial Stocks.

NEW YORK, July 14, 1909.

The stock market has been steady since the date of our last report, notwithstanding the fact that this is midsummer and transactions are running rather lighter than usual. An interesting event of the week was the appearance on the New York curb of the stock of the Southern Iron & Steel Company, which has acquired the properties of the old Southern Steel Company. The first transactions took place July 12, when the common stock opened at 17½ and sold down to 16½, with sales of 2000 shares reported, and the preferred stock opened at 54½, selling down to 54, with sales of 500 shares. On the Consolidated Exchange of New York, commonly known as the "little board," United States Steel common sold at 70 on July 12, which was the first time that this price was ever reached in a stock transaction. On the 13th the same price was touched on the large Exchange. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	14½ - 15½	Railway Spr., pref.	104%
Allis-Chalm., pref.	51½ - 51½	Republic, com.	31 - 32%
Beth. Steel, com.	30 - 30%	Republic, pref.	104½ - 105
Beth. Steel, pref.	59½ - 60½	Sloss, com.	82½ - 83½
Can. com.	11½ - 11½	Sloss, pref.	116½
Can., pref.	80½ - 82	Pipe, com.	30 - 31
Car & Fdry, com.	57½ - 58½	Pipe, pref.	80 - 81½
Car & Fdry, pref.	117½ - 118	U. S. Steel, com.	67½ - 70
Steel Foundries	48½ - 51	U. S. Steel, pref.	125 - 126½
Colorado Fuel	43½ - 44½	Westinghouse Elec.	84 - 85½
General Electric	163½ - 164½	Chi. Pneu. Tool.	24 - 24½
Gr. N. ore cert.	75½ - 77½	Am. Ship, com.	59½ - 60
Int. Harv., com.	84½ - 85½	Am. Ship, pref.	107½
Int. Harv., pref.	121½ - 121½	Cambria	41 - 42½
Locomotive, com.	59½ - 60%	Lake Sup. Corp.	22 - 22½
Locomotive, pref.	118 - 118½	Penn. Steel, pref.	115½ - 116½
Nat. En. & St. com.	15 - 18	Crucible St., com.	8½ - 9½
Pressed St., com.	43½ - 44½	Crucible St., pref.	72 - 73
Pressed St., pref.	105½ - 106½	Har. W. Ref., com.	20½ - 20½
Railway Spr., com.	43 - 43½		

Last transactions up to 1.30 p.m. to-day are reported at the following figures: United States Steel common 69½, preferred 125, bonds 105½; Car & Foundry common 57½, preferred 117½; Locomotive common 59½, preferred 118½; Steel Foundries 51; Colorado Fuel 43½; Pressed Steel common 43½, preferred 106½; Railway Spring common 43½; Republic common 31½, preferred 104½; Sloss-Sheffield common 83½; Cast Iron Pipe common 30, preferred 80%; Can common 11, preferred 80½.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s. due January, 1926	89	89½
Bethlehem Steel purchase money 6s. August, 1998	117	118½
Buffalo Iron 5s. October, 1925	95	100
Buffalo & Susquehanna Iron 1st 5s. June, 1932	99%	
Buffalo & Susquehanna Iron deb. 5s. January, 1926	94	98
Dominion Iron & Steel 5s. July, 1929	93½	
La Belle Iron Works 1st 6s. December, 1923	104	104½
Lackawanna Steel 1st 5s. April, 1928	98	
Maryland Steel 1st 5s. February, 1922	102	103
Penn Steel Company 1st 5s. November, 1917	102	103
Pennsylvania & Maryland Steel 6s. September, 1925	108	110
Republic Iron & Steel 1st 5s. October, 1934	101½	101½
Sloss Iron & Steel 1st 6s. February, 1920	107	108½
Sloss Iron & Steel consol. 4½s. April, 1918	94½	98½
Jones & Laughlin 1st 5s. May, 1939	100½	100%

United States Steel Corporation.

Collateral Trust 5s. Series A, C, E. April, 1951	114½	115½
Collateral Trust 5s. Series B, D, F. April, 1951	114½	115½
Sinking Fund 5s. April, 1963	105%	106
Union Steel 1st 5s. December, 1952	105½	106
Clairton Steel 5s. 1908-1913	100	
St. Clair Furnace 1st 5s. 1910-1939	100	
St. Clair Steel 1st 5s. 1908-1926	100	
Illinois Steel deb. 5s. January, 1910	100%	
Illinois Steel 5s. April, 1913	100%	101

All bonds quoted "and interest."

It is reported that the International Steam Pump Company contemplates a bond issue of \$6,000,000 or \$7,000,000.

The Phoenix Steel Company of Pittsburgh in Receiver's Hands.—At Pittsburgh, Edgar E. Wertheimer has been appointed receiver of the Phoenix Steel Company of that city. It has a plant at Economy, Pa. It is

stated that the company has assets of over \$83,000 and liabilities of \$15,533.45. It has been doing a structural and erecting business, but some time ago ceased to operate its shops and leased them to another concern. It, however, had a number of important contracts on hand, and it was decided to go ahead with them, as it would be profitable to complete them. The application for receivers was made when creditors began to press claims prior to the completion of these contracts. It is held that the completion of the contracts would be better for creditors, as well as for the stockholders. The capital of the company outstanding is about \$90,000, and it is believed that with proper management there would be no loss attached to the winding up of the business.

The Inland Steel Company Will Enlarge Its Sheet Capacity.

Plans have been completed by the Inland Steel Company, Chicago, for the enlargement of its sheet plant at Indiana Harbor, Ind., by the addition of eight hot mills, with provision for the installation of eight more mills. With the 10 hot mills which constitute the present sheet mill capacity, the plant will then have a total of 26 mills. The total sheet rolling capacity will be 10,000 tons a month. Contracts have been let for the building and part of the machinery, which will include engine, crane, shears, &c.

It is expected that the first eight mills will be ready for operation by the end of the year. The galvanizing capacity will at the same time be more than doubled. Five new galvanizing pots will be put in in addition to the three now in use, so that when completed the output from this department will be 250 tons a day. The construction of a large warehouse is also included in the proposed improvements, the entire expenditure for which will be about \$500,000.

Labor Notes.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, manufacturer of iron and steel roofing, black and galvanized iron and steel sheets, Mahoning expanded metal lath and other specialties, has signed the Amalgamated scale, and its entire plant was put in full operation July 12, with good prospects ahead.

The puddling department of the plant of the Youngstown Sheet & Tube Company at Youngstown, Ohio, resumed operations July 12, the company having signed the boiling scale of the Sons of Vulcan. It has not yet made a scale agreement with the Amalgamated Association for its puddling and sheet mills. Puddlers belonging to both organizations are employed.

Worcester Metal Trades Outing.—The Worcester branch, National Metal Trades Association, entertained members of the Boston and Providence branches at Edgemere, Lake Quinsigamond, July 9. There was a large gathering. A shore dinner was served, after which there was a ball game between nines of the Worcester branch and the combined visitors, which Worcester, with the assistance of its Fitchburg members, won by 6 to 4. Launch rides on the lake were a pleasant feature of the occasion. The committee in charge consisted of John W. Harrington, Harrington & Richardson Arms Company, chairman; Frank L. Coes, Coes Wrench Company; John C. Stewart, Stewart Boiler Works, and Donald Tulloch, the association secretary.

The Pencoyd Iron Works of the American Bridge Company, Pencoyd, Pa., rolled July 7 the heaviest steel angle ever rolled. It was rolled on a 23-in. mill; it measured 8 in. x 8 in. x 1½ in.; its finished length was 125 ft., and its finished weight was 7375 lb. The angle goes into some bridge work for the Philadelphia & Reading Railroad.

The unsecured creditors of the Birmingham Coal & Iron Company have been paid their claims in full, without interest, by the Reorganization Committee.

The Pennsylvania-Hudson Tunnels.

The Pennsylvania Railroad has completed the construction of its tunnels under Bergen Hill and the Hudson River into its station at Seventh avenue and Thirty-third street, New York City. The final inspection has just been made by Samuel Rea, second vice-president of the Pennsylvania Railroad Company, and Charles M. Jacobs, chief engineer of the North River Division, and the work has been pronounced in condition to proceed with electrification, signaling and track laying. This will be undertaken immediately and pushed forward as vigorously as possible. Thus culminates the construction work on the first two tunnels to be built for trunk line service under the Hudson River. The first excavation was begun May 12, 1905. The north tunnel was joined September 12, 1906, and the south tunnel October 9, 1906. The tunnels under Bergen Hill were connected May 7, 1908, and April 11, 1908, respectively.

These two tunnels, which are 23 ft. in exterior diameter, are lined with 2 ft. of concrete, and, therefore, are of 19 ft. interior diameter. They extend from the Hackensack portal under Bergen Hill to Weehawken shaft, a distance of 1.2 miles, and from the latter shaft to Ninth avenue, New York, 1.4 miles. In the course of their construction 501,995 cu. yd. of material have been excavated. For blasting 1,201,000 lb. of powder have been used. The tunnels contain 64,265 tons of cast iron and steel, while in addition 740 tons of structural steel were used. In bolting the segments together 2606 tons of steel bolts were utilized. In the various concrete linings 240,500 barrels of cement were consumed and 170,400 cu. yd. of concrete were installed. In addition, there were 4980 cu. yd. of brick work, and in the benches alongside of the tracks 1,827,396 duct feet, or 346.1 miles of conduit, were installed.

The Tax Burdens of German Industry.

On June 12 there assembled at Berlin 6000 representatives of German industry and finance, under some of their great leaders, to protest against the plans of the Finance Commission, the result being the formation of an association called the "Hansa-Bund." In the course of the proceedings Emil Kirdorf, who is at the head of the great Gelsenkirchen coal and iron consolidation, presented some striking figures on the tax burdens which German industrial corporations must bear, and how they have grown. Since 1873 the sums paid per annum for state and local taxes and for pension, accident and other workmen's funds, have been as follows:

	Marks.	Percentage of net profit.
1873.....	104,235.92	4.63
1880.....	173,106.70	16.24
1890.....	742,813.32	18.38
1900.....	2,228,528.77	23.64
1907.....	6,004,020.39	34.76
1908.....	7,065,595.43	54.18

The increase in 1908 over 1907 was, therefore, \$250,000, although production and working force continued almost the same. Herr Kirdorf figures out that the proposed increases in local and other taxes, in stamp duties and an export duty on coal would carry the total to 73.35 per cent. of the net profits of the company on the basis of the 1908 returns.

The International Acheson Graphite Company, Niagara Falls, N. Y., reports remarkable expedition in filling an order. After 1 o'clock on Friday, July 3, a telegram calling for the shipment of a carload of electrodes 8 in. x 48 in. by express was received. The factory and an express company were immediately notified. At 5 p.m. an express car was delivered on the track in front of the products building. At 5.30 p.m. a locomotive on the Niagara Junction Railroad was pulling away with the loaded car for delivery to the Michigan Central, and very early on Saturday morning the electrodes were delivered to the consignee in Chicago. The regular shipments of the day were not interrupted, there was no overtime, and the consignees were made happy by the prompt shipment. The value of the service to the con-

sumer is more apparent when it is known that if the business judgment of the Acheson Graphite Company had not been such as to have these very large electrodes in stock a delay of from 10 to 12 weeks would have resulted.

Cincinnati Metal Trades Outing.

The Cincinnati branch, National Metal Trades Association, enjoyed an outing July 10 at the Laughey Club, near Aurora, Ind. Vice-President Samuel Moyer of the Lunkenheimer Company was chairman of the Entertainment Committee and showed his excellent qualifications for that important position, providing a succession of most enjoyable events. Robert Alter of the American Tool Works Company took a group picture of the members and their guests. A special feature of this gathering was the general use of automobiles as a means of transportation from Cincinnati to the scene of the outing. Quite a number thus made the journey on the previous evening, securing a somewhat longer respite from the cares of business. Following is a list of the participants: Samuel L. Moyer, Henry Ritter, Charles Ritter, Jr., D. C. Jones, Jerome Aull, H. Wunder, Lunkenheimer Company; John W. Neil, John H. McGowan Company; W. Schellenbach, John B. Morris Foundry Company; W. J. Radcliffe, E. A. Kinsey Company; Andrew Messmer, Andrew Messmer Company; C. M. Bigger, Firth Sterling Steel Company; N. W. Dingwall, Chicago Drop Forging Company; Emil Von Wyck, Von Wyck Machine Tool Company; J. R. Vandyck, Vandyck-Churchill Company; G. F. Ahrens, John P. Ahrens, Charles H. Fox, G. W. Krapp, Ahrens Fire Engine Company; J. B. Doan, Robert Alter, A. E. Robinson, American Tool Works Company; W. C. Heindel, Cincinnati Lathe & Tool Company; F. A. Geier, P. O. Geier, E. M. Chace, Cincinnati Milling Machine Company; George Langan, George Langan, Jr., B. B. Quillen, Cincinnati Planer Company; H. M. Moore, Cincinnati Punch & Shear Company; William Herman, Fosdick Machine Tool Company; E. H. Hargrave, E. H. Hargrave, Jr., Cincinnati Tool Company; N. Chace, A. R. Murray, Cincinnati Shaper Company; E. N. Atkins, F. N. Temple, J. W. Atkins, Warner Elevator Company; Henry Dreses, Dreses Machine Tool Company; H. E. Hall, *The Iron Age*. Assistant Secretary John M. Manley was detained at home by the illness of his son.

Westinghouse Electric Business.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received an order for two rotary converters of 4000 hp. to be built for the Interborough Rapid Transit Company of New York City. Specifications also have been received for two converters to be built for the Philadelphia Rapid Transit Company of almost equal size. Work is under way on the equipment for the large power house for the Pennsylvania Railroad's electric terminals in New York City; this is a part of the \$5,000,000 contract received last April. The main power house for the new Pennsylvania system will be located at Long Island City, with substations in New York City, Jersey City and elsewhere, as needed, and the equipment will be on a scale never before attempted in electrical construction. The switchboard for the central power house, which is now under way, will be the largest ever constructed.

A recapitulation of the orders received at the Westinghouse Electric & Mfg. Company's plant in June shows that it is almost back to the high mark established in 1908. The total business booked by the company for the fiscal year 1908 was \$36,000,000. Last month's orders aggregated \$2,500,000, which is at a rate of \$80,000,000 for the year. The management claims that last month established a new high record in the number of separate orders received, the total being over 6000. The company's orders for electric mining locomotives and machinery have largely increased in the past two months. Among the largest mining equipment orders of the year is one from the Dos Estrella Mining Company of Mexico, which includes a 2000 hp. turbo-generator.

The Machinery Trade.

NEW YORK, July 14, 1909.

The important feature of the machinery trade the past week was the receipt of two extensive lists of machine tools, one from the American Locomotive Company and the other from the Fiat Automobile Company. These are the largest lists that have come out since the one issued some months ago by the Delaware, Lackawanna & Western Railroad, which has not yet been closed. It is likely that purchases will be made shortly against the three lists, when the most important buying movement of the year will be begun. In addition to these large inquiries several of fair size have been received and there appears to be more activity displayed by prospective purchasers. While the volume of orders received since our last report varied but little from that of the previous week, the number and importance of the inquiries indicate a substantial betterment in the near future. For some time trade has consisted almost wholly of small lots of tools, and it is thought that the coming into the market for the large lists of tools will hasten the expansion of trade which has been taking place very gradually.

American Locomotive Company's Extensive Machinery Requirements.

The extensive list of machine tools which has been expected for some time was sent to the trade for bids a few days ago by the American Locomotive Company, New York, and it is understood that this list is the largest received in the trade for a long time. As will be remembered, the company issued a list of machine tools aggregating \$200,000 in value last fall, which was held up, and it is understood that the list now before the trade covers about the same quantity of tools. These machines are to be purchased for the various plants, but many of them will likely be installed in the plants at Dunkirk and Schenectady, N. Y., where important improvements have lately been made. It is the intention to bring the efficiency of all its important plants up to that at Schenectady and this will mean the purchase of this large amount of machinery. At the Brooks plant construction was started a short time ago on a new tank shop and machine shop, 185 x 600 ft., and plans and specifications were recently sent out for another building to be 185 x 823 ft.

From all accounts the attention of the machinery trade will shortly be turned toward Gary, Ind., as there are reports out that both the American Car & Foundry Company and the American Locomotive Company are preparing preliminary plans for the construction of the large plants in that industrial city. Some preliminary estimates have been made and plans are now under way for a plant for the American Car & Foundry Company, to be located on 210 acres of ground recently acquired, directly northwest from the town proper, with the Calumet River as the southern boundary. The plans provide for a plant which will occupy a large part of the ground the company has acquired. As yet the trade has heard of no machinery inquiries from that source, nor will they come until contracts are given out for the construction of the buildings, which may happen shortly. As has been stated, the American Locomotive Company has 130 acres of ground in Gary, and it is said among those familiar with the company's affairs that when the changes now being made to a number of its plants are completed the question of building the Gary plant will be taken up.

Machinery List Issued by Fiat Automobile Company.

An extensive list of machine tools was issued last week by the Fiat Automobile Company, New York, which will be purchased to equip the large plant the company intends to erect in the vicinity of New York for the manufacture of automobiles in this country. It is possible that the plant will be located at Poughkeepsie, N. Y., where we understand negotiations have been under way for the necessary ground. It is the intention of the company to expend a large sum of money in the erection and equipment of a plant. The entire project as outlined, we understand, will entail the expenditure of over \$500,000, and while it is not likely that this sum will be spent at the beginning, the initial plant will be a good sized one and will necessitate the purchase of an extensive line of machinery. The automobile industry has been an important factor in the trade for some time and the expansion in that industry which is now taking place in this vicinity will mean large purchases of machinery from houses in this section which heretofore have not been able to secure much of the business from the automobile builders, as a large proportion of them are located in the West. The Fiat project is about the largest of its kind that has come up in this territory for several years, and the complete equipment for the entire plant will likely include considerable additional machinery to that on the list now before the trade.

It is understood that the York Motor Company, York,

Pa., is in the market for considerable additional equipment for its plant, the inquiries covering machines to the value of about \$10,000. This company recently purchased quite a little new machinery for its plant.

Plans are being prepared by Thomas Rowe, 237 Lexington avenue, New York, for a good sized plant to be constructed at Astoria, L. I., for the Palmer & Singer Mfg. Company, manufacturer of automobiles. The plant will consist of a three-story building, 115 x 181 ft. The size of the power plant and the other machinery details have not been decided upon as yet, but it is probable that Mr. Rowe will have charge of the buying arrangements.

The New York Central Railroad has plans under way for the construction of another large blacksmith shop and machine shop to be erected at West Albany, N. Y. The building is to be of brick and steel construction, 150 x 600 ft. A special feature of construction will be the large amount of glass to be used on the roof and one end and side of the building. Invitations for bids will be sent out in a few days. The road has completed plans and will soon call for bids on the construction of machine shop, blacksmith shop and storeroom building, 40 x 300 ft., construction to be of brick and steel, to be erected at Lyons, N. Y., at a cost of \$50,000, and has awarded the general contract to the Pittsburgh Construction Company, Pittsburgh, Pa., for the construction of the new \$400,000 railroad shops, 30-stall roundhouse and yard improvements at Corning, N. Y.

Engines and some light machinery for the finishing department will be purchased by the Sheldon Axle Company, Wilkes-Barre, Pa., for equipping the additions to its plant. Most of the other machinery required will be built by the company at its works. An addition to the spring plant equal to the present capacity is being built, which will increase the output to about 2500 sets of carriage and automobile springs per day. The new building will be devoted to the manufacture of high grade automobile springs exclusively and when finished will have a capacity of about 10,000 tons of springs a year. The company is also anticipating increasing its axle plant to include an already established line which is constantly increasing for commercial vehicles.

The Vulcan Diecasting Company of Seawarren, N. J., has been doing considerable buying of late for a new foundry it recently constructed. In addition to foundry equipment the company has purchased considerable in the way of transmission machinery, which was furnished by the Crane Company, Newark, N. J.

The American Concrete Construction Company, Union Building, Newark, N. J., is the engineer on a new plant which is being built at Watsessing, N. J., by Scott & Bowne, the emulsion manufacturers. The plant is to be a large one and the machinery equipment is now being arranged for.

The Frontier Iron Works, W. F. Semon, president and general manager, Buffalo, N. Y., has started construction on the machine shop building, which is the last of a group of four buildings to comprise a new plant for the manufacture of cylinders for automobile and marine gasoline engines, which will now be the exclusive article to be manufactured by the company. Owing to the recent successful record made by the gasoline engine with which the Thomas car that made the trip around the world was equipped, and the cylinders and castings of which were made by the Frontier Iron Works, the company has been flooded with orders which necessitated the construction of a new plant, which is now nearing completion. The new foundry will begin operations in about two weeks and the balance of the plant by September 1. Orders for all machinery to be used in the buildings for the present have been placed, but after the vacating of the Auburn avenue plant the machinery will be moved to the new building, and about November 1 the company contemplates adding a line of machinery for rough boring of engine cylinders and a few additional planers.

The General Chemical Company, Passaic, N. J., has been buying considerable equipment of late for its plant at Paterson. The company's requirements include power equipment, transmission machinery, &c.

The Rutherford Comb Company, Rutherford, N. J., has been buying some power and transmission equipment in this territory for an addition to its plant. Russell C. Cory, 39 Cortlandt street, New York, is the consulting engineer and he is handling the buying details.

Walter G. Kirkpatrick, Jackson, Miss., has been engaged as engineer for the construction of several water works systems which will entail the purchase of considerable machinery. He has been engaged by the Water Works Commission of Chattanooga, Tenn., to prepare plans and specifications for a new municipal system of water works, for the construction of which an issue of bonds in the sum of \$900,000 has been authorized. The supply will probably be secured from the Tennessee River, with mechanical filtration, pumping into reservoir and gravity distribution through cast iron mains, also a separate high level system. In conjunction with W. N. Dunlap, city engineer of Johnson City, Tenn., Mr. Kirkpatrick will draw plans for a new municipal water system for that city, to cost about \$250,000. Bids will be received until August 3 for about 7 miles of 8 x 12 in. pipe sewer, with two purification plants, for Monticello, Ark.

Two additional barge canal contracts, aggregating an expenditure of over \$3,000,000, have been awarded by F. C. Stevens, Superintendent of Public Works, Albany, N. Y. Contract No. 30, providing for the construction of the canal, river and land line from Little Falls to Sterling Creek, has been awarded to the Acme Engineering & Contracting Company, Schenectady, N. Y., for \$2,591,666. Contract No. 40, providing for the construction of the canal from the Herkimer-Oneida county line to Oriskany road, has been awarded to the Shanley-Morrissey Company at \$1,164,625.

♦♦♦ New England Machinery Market.

BOSTON, MASS., July 13, 1909.

It is difficult to find an industry which is not feeling the bettered condition of business. Shops and factories are starting up again after vacations, and so far as can be learned all are finding conditions better than when they closed down. With the machine tool builders business is holding up remarkably well for hot weather. It is time for any material slump to assert itself, if it is to come this summer, but such falling off in orders as has been experienced is very moderate indeed. The dealers report numerous inquiries. The engine builders are much busier than they have been, and a considerable amount of new business is in sight. Some complaint of prices is still heard. The boiler business is keeping pace with engines, and on the whole is rather better, owing to the number of renewals. The exceedingly bright prospects of heavy crops as indicated by the latest Government reports have already had a certain amount of stimulating effect, and the improvement in the steel and iron markets is having a strong influence. No one expresses a doubt as to a still more rapid improvement in manufacturing generally with the return of cool weather.

The Ayer Mills, Shawmut Building, Boston, is in the market for the machine tools and woodworking machinery to equip the repair shops of the great mills now building at Lawrence, Mass. The shops will be large, comparatively speaking, and the list is a considerable one. The machine tools include a miscellaneous equipment, without grinding machinery or boring mill.

The Dahlquist Mfg. Company, South Boston, Mass., will be in the market for the equipment of a new factory building, 50 x 50 ft., three stories, which will be devoted to the manufacture of copper range boilers. The company plans to purchase only the most modern machinery for the purpose.

W. H. Nichols, Waltham, Mass., manufacturer of watch tool machinery, has taken larger quarters on Gifford avenue. New machinery will be added gradually.

The United States Arsenal, Watertown, Mass., has finally awarded the contract for the big horizontal boring, drilling and milling machine, the successful bidder being the Niles-Bement-Pond Company, whose price was just under \$15,000. The machine weighs about 200,000 lb., and has a 9-in. boring bar. It will be used in the manufacture of the new heavy gun carriages, models for which are now going through the works at Watertown.

The H. G. Thompson & Son Company, New Haven, Conn., manufacturer of hack saw blades and hack saw machines, has purchased the business of Carr Bros., Syracuse, N. Y., manufacturers of tool holders, and the complete line will be manufactured at the New Haven factory.

Negotiations are on by which the Tobin Arms Company, Norwich, Conn., will remove its entire business to Woodstock, Ontario. A chief motive for the change is the fact that there is no shotgun factory in Canada.

The Standard Brass & Copper Tube Company, New London, Conn., states that it will have its machinery installed and begin manufacturing on August 15.

The John T. Young Boiler Company, Norwich, Conn., has begun the manufacture of a line of steam and hot water radiators.

The Middlebury Marble Company, Middlebury, Vt., announces that it will spend \$500,000 in developing its properties in Middlebury, Pittsford and New Haven, Vt., and will build a 20-gang mill at Middlebury in the fall. A large water power has been purchased, and will be developed for the generating of electric power, it is understood.

The plans of the Warner Bros. Company, Bridgeport, Conn., manufacturer of corsets, for extending its works, include a brick and steel power house, 94 x 107 ft., a building for the metal department providing 48,000 sq. ft., and a building having 30,000 sq. ft. for the box shop.

A dispatch from Pittsfield, Mass., states that the General Electric Company has purchased the factory of the Cheshire Shoe Company in that place and will utilize it as an addition to the Stanley plant. The building is 120 x 200 ft.

A late unverified dispatch from Springfield, Mass., states that the Pratt & Cady Company, Hartford, Conn., and the Chapman Valve Company, Indian Orchard, Mass., are considering a plan of consolidation. The report states that if the plan is carried out the Pratt & Cady Company's works

will be moved to Indian Orchard, which is a close suburb of Springfield. The companies manufacture similar products, including valves, hydrants and fittings.

Additions to general manufacturing enlargements include the following: Emerson Shoe Company, Rockland, Mass., wing, 42 x 123 ft., three stories and basement; Hockanum Company, Vernon, Conn., office and dye house, to cost \$75,000; United States Finishing Company, Norwich, Conn., additional factory to Sterling plant, 50 x 140 ft., five stories. Still other new construction includes Bigelow Carpet Company, Lowell, Mass., dye house, 46 x 687 ft., with central building, 125 ft. long, and five stories, and two wings each 280 ft. and two stories, one wing only to be erected immediately; Kilburn Mill, New Bedford, Mass., textiles, tentative plans for large additions, land for which has just been purchased.

The Standard Metal Work Company, Thompsonville, Conn., manufacturer of automobile parts, has decided to double the size of the extension to its factory, announcement of which was made recently, which will sextuple its capacity. The business has been constantly growing, making the radical increase in the works imperative. The business has just been incorporated under Connecticut laws with an authorized capital stock of \$75,000, beginning business with \$60,000. The incorporators are James A. Colvin and Mark W. Bushnell, Thompsonville, and Lucius F. Robinson, Hartford. The company is closely identified with the G. H. Bushnell Press Company, Thompsonville, of which Mr. Colvin is the proprietor and Mr. Bushnell manager. The special products of the Standard Metal Work Company are piping for the gas intakes of automobiles, water intakes and outlets, gas exhaust manifolds and pipes, and special and difficult piping requiring bends, autogenous welding, &c.

The Miner & Peck Mfg. Company, New Haven, Conn., has added to its line of machines a four-poppet and a six-poppet drop, designed for silver ware and jewelry manufacturing and other lines of metal stamping work. Each is built in five sizes, the weight of hammer in the four-poppet ranging from 50 to 300 lb., and in the six-poppet from 300 to 800 lb.

There has been considerable speculation in the daily press as to the reason for the amendment of the charter of the Winchester Repeating Arms Company, New Haven, Conn., recently granted by the Connecticut Legislature. Under the charter as it now stands, the company has the usual privilege and latitude of the present law, while before the amendment the charter was governed by conditions as they existed at the time of its granting, 40 years ago. The action savors more of a formality than of the hinted plans for expansion into other fields of production.

The Richard French Iron Works, 84 Union street, Worcester, Mass., manufacturer of builders' iron work, has purchased 45,000 sq. ft. of land on Albany street, East Worcester, and plans to erect a modern plant on the premises this season. Only tentative plans for the building have been made, but the present intention is to erect a shop about 60 x 150 ft., one story, with crane bay and broad gallery for the lighter tools. New equipment will be required later, but the company has yet no definite idea of what will be needed. New cranes will be installed, and more power than can be furnished by the company's present plant will be needed. The business is an old one, with a patronage extending through New England.

The Lombard Machine Company, Stafford and Heard streets, Worcester, Mass., is planning to increase its works by the erection of a two-story brick building, about 50 x 125 ft. and two stories. The company manufactures worsted cards and preparing machinery and is extending its shops with the intention of producing a new woolen and worsted loom. The capital stock will be increased from \$25,000 to \$100,000.

The Byron Weston Company, Dalton, Mass., paper manufacturer, will build an addition to its Centennial mill, 80 x 180 ft., and three stories. It is announced that the addition as well as the present mill will be equipped for electric power throughout, and that a surface electric railroad will be put in to transport materials between this and another of the company's mills.

H. L. Gilman & Co., 32 Linden street, Brookline, Mass., states that the construction of the new shops for the building of hydraulic elevators, general machinery and bridge and structural work has been delayed, but that it is expected to start the erection of temporary shops in the fall, and to then install machinery with which to begin work on contracts already in hand. The building will be about 140 x 400 ft. There will be a 10-ton traveling crane. The building will be used partly for the storage of materials for the wharf, dock, factory and storehouse improvements of the American Building Trust, the plans for which call for the expenditure of \$12,000,000. The list of machinery which will be needed in the shop is not yet ready.

The factory which the Southington Industrial Improvement Company will build for the occupancy of Matthias Mohr, who will manufacture screw drivers, will be 40 x 80 ft., one story. Work will begin immediately.

The Holyoke Motor Foundry Company, Holyoke, Mass.,

is installing a new furnace. An addition has recently been completed.

Cincinnati Machinery Market.

CINCINNATI, OHIO, July 13, 1909.

Conditions quite satisfactory to Cincinnati manufacturing interests may be said to prevail—that is, there has been a steady increase in business and inquiries since the turn of the half year, and the prospects for a big fall and winter are manifesting themselves more plainly every day. For the first time since the depression first set in, indicated to the tool and machinery trade by cancellations of advance orders, there are tool manufacturing plants unable to guarantee immediate delivery. This is true of two types of tools at least—the milling machine and shaper. An excellent opportunity to gather information on the outlook for the tool trade was furnished in the midsummer gathering of members of the Cincinnati branch, National Metal Trades Association, on Saturday, July 10, at a favorite suburban club. Here were half a hundred representatives of the largest tool making establishments in the Central West, all of whom talked freely of better conditions and prophesied steadily improving times. A large concern making milling machines is booked up to next October; the same is also true of a shaper manufacturer. Upright drills are gaining headway daily, and a representative establishment in this territory making a specialty of the larger and more modern types of both the upright and radial drills has recorded some excellent sales to manufacturers of electric equipment and automobiles, and is ordering castings in lots of 80 to 100.

The turn of the year 1909 will be an eventful one to Cincinnati tool manufacturing interests in other ways than trade; for it will mark the real beginning of operations in the new factory suburb of Oakley. The Triumph Electric Company's fine plant is the latest to attract general attention. The skeleton framework is finished, and the exterior is assuming form. The main building has a frontage of 140 ft., and is 352 ft. in depth. A central space, intended to be clear to the sawtooth roof for the accommodation of the traveling cranes, &c., will be 40 ft. wide. The bays on either side will have three floors each, affording a total floor space of 125,000 sq. ft. The pipe plant in the rear will be 60 x 140 ft. The Modern Foundry Company, housed in a building in which is installed the most powerful and modern equipment known to the science of modern molding, is already in successful operation; the Peck-Williamson Company, which recently discontinued its plant at Wellston, Ohio, is building its new foundry.

In other than tool lines is the improvement in conditions marked. A large establishment making boilers and engines is just rounding out this month a year that is remarkable in more ways than one. The high water mark of business of this concern was about \$461,000—the year which included the high pressure first half of 1907. Estimating for July, the last month of the fiscal year 1908-1909, on the basis of June's record, the business of the year will total \$425,000. Its product goes largely into the South and Southwest, and business in this line at the present time is said by the firm to be very promising.

Foundries in the Cincinnati District are improving rapidly in melts. The average three heat a week run has been in many cases increased to five and six, and a fair estimate of the existing conditions would be to say that the average is between 65 and 75 per cent. of normal. A considerable tonnage of pig iron has been bought by foundrymen, anticipating a good fall trade from the machine tool men.

The improvements under way at the shops of the Chesapeake & Ohio Railroad at Huntington, W. Va., are attracting a good share of attention from tool manufacturers, as a number of new tools will be needed to equip them. The cost of the buildings, which are to be erected and equipped under the direction of Westinghouse, Church, Kerr & Co., will be \$400,000.

Another important improvement in the Central States District which is interesting local tool and machinery manufacturers is the plant of the Miles Steel Casting Company, a \$300,000 concern, on which work is just beginning, at Midway, a suburb of New Albany, Ind. The plant will be equipped for the casting of steel gears for electric cars, machine tools, and a department will be devoted to malleable iron casting. As soon as the steel plant is in successful operation, work will be commenced on a rolling mill for the manufacture of an anti-rust fence post, on which W. J. Miles, Jr., the active head of the company, holds patents.

Material is being assembled at the plant of the American Roll & Foundry Company, Canton, Ohio, for the construction of additions to the buildings. The Canton Bridge Company holds the contract. The addition to the machine shop will be 60 x 60 ft., and the foundry will be enlarged by an

addition 40 x 60 ft. A 25-ton electric crane is to be installed in the machine shop. The improvements are expected to be completed by September 1. The company is running its present equipment at full capacity, with full force, and is said to be compelled to sublet some parts of its work in order to fulfill contracts.

A large bulletin board displayed at the office of the Cincinnati branch, National Metal Trades Association, tells the story of improving conditions in the shops. This is full of requests for skilled mechanics, and in addition Secretary Manley is advertising in many daily newspapers throughout the territory. There is scarcely a tool establishment in the Cincinnati field that is not asking for additional help. At the shops of the Clover Leaf Railroad in Frankfort, Ind., Master Mechanic M. Maree is advertising for car repairers to work at piecework; also in the Lafayette, Logansport and other shops of the system.

The Oakland City Machine & Supply Company, owned by T. M. and L. A. Shearer of Evansville, Ind., is a new institution for the repairing of oil drilling and general machinery.

The Bonny-Floyd Company, Columbus, Ohio, a comparatively new concern organized at the time of the beginning of the depression, has made an excellent record and is said to have on hand orders sufficient to operate its plant nearly to capacity. The company manufactures steel and other castings.

The Seagrave Company, manufacturer of fire-fighting apparatus at South Columbus, Ohio, is reported to be contemplating the building of an addition to its factory.

Milwaukee Machinery Market.

MILWAUKEE, WIS., July 13, 1909.

The usual midsummer dullness has settled upon the market here, so far as outward signs of activity are manifest, but the undertone of business continues strong and most shops are busily engaged upon orders recently taken. Steel castings are in demand to an extent which shows that a great deal of new machinery is now being built and orders run largely to heavy sizes. Collections have become much easier than heretofore; more manufacturers are taking advantage of discounts and the banks have loosened up on loans needed in the discharge of current business. The tariff, however, remains a disturbing influence; its effect appears in some of the most unexpected quarters, and even those whose trade can hardly be directly affected very much will find considerable relief when the leading schedules are definitely determined upon.

An encouraging feature of the local situation is the increasing sale of traveling cranes, hoists and conveying machinery designed for handling heavy material. Inquiries are now coming chiefly from the iron and steel producing centers, from copper, lead and zinc smelters and from metal working industries of various descriptions. In other lines of production advantage was earlier taken of the low prices prevailing and for the present their requirements are largely filled.

The influence of construction work in the Central and Northwestern States is beginning to be more generally appreciated; indications now point to a volume of new building which will surpass that of any year in the history of these sections, covering, as it does, not only the natural growth of one season but also the deferred filling of the necessities of two preceding years. Practically nothing has thus far been undertaken by manufacturers and others in the way of extensions or wholly new construction, except what is urgently needed; so plenty of room is still left for expansion.

Among new buildings planned by Northwestern manufacturers are a three story structure, 60 x 160, for the Dempster Mill Mfg. Company, Beatrice, Neb., for implement making; electrolytic refineries, Elkhorn Electro-Metals Company, Elkhorn, Mont.; farm vehicle factory, Benedict & Christie, Farley, Iowa; new engine house, C. C. Rasmussen & Son, Harlan, Iowa; fabricating plant, Ritchie Corrugated Culvert Company, Ottumwa, Iowa; warehouse, Schwartz Mfg. Company, Plymouth, Wis.; boiler house, dry kiln and finishing department, Wisconsin Furniture Company, Milwaukee; new factories for the Weyenberg Mfg. Company, Milwaukee; Bentley & Olmsted Company, Des Moines, and the Sterling Wheelbarrow Company, West Allis, Wis., and two additions to the plant of the Racine Mfg. Company, Racine, Wis. For these a large quantity of machinery of various kinds, including power and electrical equipment, will be purchased before fall, and inquiries should be sent to the addresses given.

Ground has been broken by L. Kissel & Sons for a new automobile factory, 45 x 220 ft., two stories, Hartford, Wis.

Contract has been let to the Power Construction Company for erecting the new electric generating station at Galena of the Tri-State Light & Power Company, Madison, Wis., A. O. Fox, general manager.

The city of Seymour, Iowa, will enter upon improvements to its water works and electric lighting system, for which new machinery is required. Purchases are not to be made until later. Geo. C. Morgan, Chicago, is engineer.

The Wisconsin River Traction & Power Company, Wausau, Wis., has had plans drawn for a hydro-electric plant of about 5000 kw., at Trappe City, Wis.

The erection of a municipal power and lighting station is being considered by Minneota, Minn.

Contract for the iron work in Gueder, Paeschke & Frey Company's new plant has been let to the Heil Company, Milwaukee. The latter also contemplates an addition to its shops, completed only a year ago.

The Miller Saw Trimmer Company, Milwaukee, now operating in rented quarters, has been offered substantial inducements to remove to Madison, Wis., and contemplates building a plant there.

Equipment for pumping stations will be needed before long at Lemmon, S. D., and Auburn, Neb., where new water systems have been determined upon.

Cleveland Machinery Market.

CLEVELAND, OHIO, July 13, 1909.

Business with the local machinery houses the past week was fairly good, although no large orders were placed. Orders, mostly for medium sized and small tools of various kinds, are now beginning to come from small machine shops making various products and doing general repair work. These shops, which for a long time have suffered from a scarcity of orders and were out of the market, have recently experienced a revival in business, and now feel warranted in making additions to their machinery equipment or replacing old tools with new ones. A little more activity is also noticed in the demand from large manufacturing plants. The demand for boring mills, in particular, has picked up considerably. There is a good demand for automatic machines from automobile manufacturers and other sources. The demand for second-hand tools has improved, but dealers report that the supply that is being offered for sale is quite limited.

The general manufacturing situation in this city has shown more marked improvement the past two or three weeks than at any time since conditions began to improve. This betterment is noticed by machine tool builders and metal working lines in general. A large number of the shops are now running at nearly their normal capacity and are adding additional workmen. Machinists are in good demand, and good skilled men are becoming somewhat scarce. The foundry trade also shows a further improvement, and a number of the foundries making light gray castings are running at full capacity and all good molders for this class of work can find employment. Foundries making heavy castings are getting more work, but there will have to be considerable further improvement before their foundries can be operated at full capacity.

The Osborn Engineering Company, Cleveland, is preparing plans for a \$500,000 cement plant that will be built at Arkansas City, Kan., by the Arkansas City Portland Cement Company. The plant will have a daily capacity of from 1500 to 2000 bbl. The Osborn Company will receive bids in a few weeks for the necessary machinery and power equipment.

The Cleveland Chain & Mfg. Company reports a steady improvement in the demand for chain, and its volume of business is now sufficient to keep the plant running at full capacity. The company recently commenced the manufacture of a self-locking steel loading chain for which, it reports, it is receiving a good demand.

David Round & Son, Cleveland, report a decided improvement in the demand for chain hoists the past few weeks. They are now running their plant at full capacity and state that indications are that in a few months the volume of orders will be better than normal. This firm has recently commenced the manufacture of hand power overhead cranes up to 6 tons capacity, and is in receipt of some good crane orders.

The Forest City Foundry & Mfg. Company and the Walworth Run Foundry Company, Cleveland, report business in a most satisfactory condition. Both plants are being run at full capacity and additional molders will be employed.

The Morgan Engineering Company, Alliance, Ohio, reports a steady improvement in the volume of its business. The company is now operating its plant at 75 per cent. of full capacity, and will soon make additions to its working force.

The Howler Mfg. Company, maker of gas stoves, alcohol stoves, self-heating sad irons, &c., has secured a site at 5109 Euclid avenue, and will remove its plant from Montgomery, Ala., to this city. The new plant is now being fitted up, and it is expected that it will be ready for operation about August 1.

The Shull Steel Casting & Mfg. Company, Canton, Ohio, has awarded a contract to the Canton Bridge Company for an addition to its plant. The new building will be of steel, 95 x 100 ft., and will provide additional space for its foundry. The company will install a drying furnace and one new annealing furnace.

The Early Sun Stove & Range Company, recently organized at Newark, Ohio, has taken over a foundry plant at Somerset, near Newark, and will soon commence the manufacture of its products. The company has organized by the election of the following officers: President, L. S. Dean; vice-president and manager, C. E. Lady; treasurer, George Wise; secretary, Edward J. Mathias.

The Transue & Williams Company, Alliance, Ohio, reports that the heavy demand for drop forgings continues and the company is running its plant night and day to keep up with orders.

The Cyclone Drill Company, Orrville, Ohio, reports that it has more orders on its books than at any previous time in its history. The plant is being run nights a portion of the time to keep up with its orders.

The Imperial Steel Range Company, Cleveland, has been incorporated with a capitalization of \$75,000, by H. F. Timnerman and others, to carry on the business now conducted under that name. No change is contemplated in the management.

Chicago Machinery Market.

CHICAGO, ILL., July 13, 1909.

Thus far this month trade has been fairly active in machinery lines, and is, as a rule, holding well up to the average of the previous month. Sales have been lately closed for quite a number of tools included in a list on which figures were asked some time ago by the International Harvester Company, which it was understood was for the equipment of a European branch. According to dealers, the tools actually purchased amounted to about \$25,000, although the value of the equipment listed in the original inquiry greatly exceeded this sum. One of the drawbacks to a wider expansion of the machine tool trade noted by dealers is the concentration of demand upon certain classes of tools. Practically all of the makers of milling machines are well supplied with orders and are gradually falling behind with deliveries, which in a few cases are being lengthened out to six and eight weeks. This, it is explained, is largely due to the automobile and gasoline motor industries, whose requirements have for some time past and still continue to supply a very large percentage of the business. This condition is further emphasized by the light demand for lathes. Under ordinary conditions these tools, being a staple in miscellaneous service, move as readily as any other machine; it simply goes to show that, while progress is being made all along the line, some industries are still lagging and have not yet reached a point where the purchase of new equipment is absolutely necessary. At the same time there is a noticeable feeling of confidence throughout the market, and it is freely predicted that by the time buying from the sources now most active begins to decline, other interests, including the railroads, will be coming into the market.

Work is soon to be started on a new packing plant to be erected for Miller & Hart at Forty-fifth place and Packers avenue, Chicago. The main portion of the plant will comprise a warehouse and cooling room of five stories, 80 x 100 ft.; fertilizing building, two stories, 40 x 80 ft.; abattoir, four stories, 80 x 80 ft., and a power house, 60 x 80 ft. Plans, which have been prepared by Zachary T. Davis, include machinery equipment for the power house, refrigerating apparatus, &c.

The Bartholomew Company, Peoria, Ill., has purchased the site and buildings formerly occupied by the Sieberling Company, which it will convert into an automobile factory. The plant will be remodeled and equipped with modern machinery for making the heavy parts of automobiles, such as axles, steering gears, &c., and will, when completed, treble the company's present capacity. A considerable amount of machinery has already been purchased for shipment September 1, but further purchases will be made as soon as this is installed.

The Joliet Railway Supply Company, Joliet, Ill., maker of the Huntoon brake beam and other railroad appliances and specialties, is having plans drawn for an additional one story building of steel and concrete construction, 60 x 230 ft., which will serve as an erecting shop and will also include the installation of a new power plant.

Plans are being prepared for a new plant to be installed for the heating and lighting of the Augustana College Building, Augustana College, Rock Island, Ill. Bids on this equipment will be invited in a short time.

The Sullivan Machinery Company, Chicago, has installed a branch office at Australasia Chambers, Martin place, Sydney, New South Wales, for the sale of its air compres-

sors, rock and diamond drills, coal cutters, &c., in the Australasian commonwealths. The establishment of this new office, which is in charge of George R. Mair, is due to the growing importance of the mining industry in that field.

Philadelphia Machinery Market.

PHILADELPHIA, PA., July 13, 1909.

The usual post-holiday dullness was to be noted during the week in many branches of the trade. Manufacturers in a number of cases have been busy with the usual midyear stock taking and many buyers of tools have been likewise engaged. June business, as reported by a number of manufacturers and merchants, shows some variation. In instances an increased volume has been booked, in others a moderate decline is to be noted; on the whole, however, the volume of business during the first six months of the year has been on a much more satisfactory basis than during the same period last year. The general tendency has been forward, and while the usual summer dullness is expected, conditions appear to be shaping themselves for better times. There has been a little inquiry for machine tools from the railroads and the outlook in this direction is believed to be decidedly better.

There has been a slightly better demand for machine tools coming from the textile machinery builders, and some little business for single tools has been placed. Small shop equipment, covering a rather general line, has been taken by several merchants, but the bulk of the business transacted recently has been in single tools, milling machines leading the demand, and some sizes of certain makes can only be had for extended shipment.

Inquiries in general are not very plentiful, the demand being rather scattered, although the business in sight is of somewhat better volume. There has been little new business from foreign sources, the demand for tools of any size in standard types being quiet. Specialties continue fairly active, although individual orders are reported as being small.

The second-hand machinery trade is not active; summer dullness prevails, and orders are somewhat scattered and of varied nature. The second-hand boiler and engine trade shows little forward movement; some good sized propositions are still under consideration, but close slowly.

A trifle more activity is to be noted in the foundry trades. Steel casting plants are somewhat better engaged, having had a larger run of orders from the railroads, locomotive builders and shipbuilding plants. Local gray iron foundries are having a somewhat more satisfactory run of orders, and while some plants are more closely approaching the normal, others still fall considerably short of 75 per cent of their capacity.

The Lebanon Valley Consolidated Water Company, Lebanon, Pa., will, it is understood, erect a pumping station and filter plant at Jonestown, Pa.

The Board of Water Commissioners of Burlington, N. J., will accept proposals until July 29 for the erection of a mechanical filter plant having a capacity of 3,000,000 gal. daily. Specifications and additional information may be obtained from George A. Allison, superintendent, Burlington, N. J.

The International Radiator Company, it is reported, has purchased the property of the Delaware Hard Fiber Company, Wilmington, Del., and will alter and improve it so as to use it for a manufacturing plant.

Bids will be opened July 21 by the Survey Bureau of the Department of Public Works of Philadelphia for a number of bridges, costing in the aggregate about \$150,000. These include a double track steel girder, 80-ft. span, on the North Pennsylvania Railroad at Chelton avenue; a 70-ft. reinforced concrete highway bridge over the Philadelphia, Wilmington & Baltimore Railroad at Sixty-second street; a three track, three span steel girder bridge at Roberts avenue, on the Chestnut Hill Railroad; a two track, three span plate girder bridge at Hunting Park avenue, on the Chestnut Hill Railroad; a two track, three span plate girder bridge at Hunting Park avenue and the Norristown Railroad. Plans and specifications may be obtained from Chief Engineer, Bureau of Surveys, City Hall.

The Philadelphia & Reading Railroad Company has awarded contracts for further work on its Ninth street elevated. The contracts closed cover work to be done between Seventeenth street and Indiana avenue, and the Port Richmond Branch of its road near Wayne Junction. The Armstrong & Latta Company has the contract for the masonry, trestle and embankment work, while the American Bridge Company has the bridge work over the intersecting streets. This closes the principal contracts for the Ninth street elevated; plans, however, are now being prepared for bids for elevation work in connection with the company's Port Richmond Branch.

The Philadelphia Roll & Machine Company continues

fairly busy. While orders for sand cast and chilled charcoal iron rolls have not been heavy individually, there has been a good run of small orders covering one or more sets. The general demand for charcoal iron castings is fair, and the outlook for a good volume of business in the early fall is anticipated.

The Baldwin Locomotive Works has recently booked orders for 20 locomotives for the Alabama Great Southern; two small mogul type engines and four 10-wheelers for the Northwestern Railroad of Brazil, and 18 Atlantic type and 4 Mallet type locomotives for the Atchison, Topeka & Santa Fé. Business with this company is steadily improving, and while the plant is operating on an irregular basis, a productive capacity of 40 per cent has been reached at times. The outlook for further business is considered good.

Government Purchases.

WASHINGTON, D. C., July 13, 1909.

The Isthmian Canal Commission will receive bids until August 2, Circular No. 523, for hydraulic punches and other supplies.

The following bids were opened July 6 for boilers for the naval station at Annapolis, Md.:

Class 101.—Four water tube boilers—Bidder 98, Mosher Water Tube Boiler Company, New York, \$3400; 183, Babcock & Wilcox Company, New York, \$4000.

The following bids were opened July 3 for item 1, one 20-ton locomotive coaling crane, and item 2, one orange peel bucket for the Isthmian Canal Commission:

American Hoist & Derrick Company, St. Paul, Minn., item 1, \$6658; 2, \$665.

F. S. Banks & Co., New York, item 2, \$705 and \$635.

Browning Engineering Company, Cleveland, Ohio, item 1, \$6625; 2, \$600.

Meade-Morrison Mfg. Company, New York, item 2, \$595.

New Jersey Foundry & Machine Company, New York, item 2, \$722.50.

Ohio Locomotive Crane Company, Bucyrus, Ohio, item 1, \$7250.

The Vilter Mfg. Company, Milwaukee, Wis., has been awarded contract for the refrigerator plant at the United States Penitentiary, Leavenworth, Kan., at \$4050.

Under bids opened June 14, Circular No. 512, for machinery for the Isthmian Canal Commission, Manning, Maxwell & Moore, New York, have been awarded class 13, one rotary splitting shear, \$1325.

Under bids opened June 22, for machinery for the navy yards, the American Wood Working Machinery Company, Rochester, N. Y., has been awarded class 61, one No. 7 power feed rod machine, \$603.

The following awards have been made for machinery for the navy yards, bids for which were opened June 29:

Vulcan Iron Works, Wilkes-Barre, Pa., class 51, one saddle tank locomotive, \$4335.

C. H. Wheeler Mfg. Company, Philadelphia, Pa., class 61, one surface condenser, \$995.

The Youngstown Wire Gauge Slide.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, is distributing a useful souvenir in the shape of a table of wire gauges printed on a card and arranged to slide in a celluloid case. A narrow slot crosswise at the top of the case exposes one horizontal row of figures making it easy to read across a table without danger of making an error, and just over the slot are marked the column headings. Sizes of wire are given in common fractions of an inch, and also by standard gauge numbers. Corresponding to each are the decimal equivalents, the weight in pounds per foot, the weight in pounds per mile and the number of feet per pound of wire. The outside of the celluloid case calls attention to the company's specialties of wire rods, annealed, bright and galvanized steel wire, wire nails, Buckeye barb wire; field fence and staples, and on the reverse side is a reproduction in colors of a keg of nails with the company's catch phrase, "Ore to Nails."

The American Bureau of Inspection and Tests, Monadnock Block, Chicago, has issued a pocket-size pamphlet containing the American Railway Association's specifications for steel rails, also the rail specifications adopted by the steel manufacturers January 1, 1909, and those of the Pennsylvania Railroad. All are for Bessemer and open-hearth steel rails, the manufacturers' specifications also covering steel splice bars. In addition, the pamphlet gives specifications which are in general use for first quality and second quality relaying rails.

HARDWARE

IT is an attractive maxim of Lord Bacon's that the union of action and contemplation in life is symbolized by a conjunction of Saturn, the planet of rest, and Jupiter, the planet of action. There are often times, with our modern mode of living, when activity has too large place and consumes time and energy with too much exclusion of quiet thought and comfort, and of the restful spirit which is suggested by Matthew Arnold's reference to "toil unsevered from tranquillity." In these days the disposition of many is to live too much under the stimulus of the planet of action and to ignore the benign influences of the planet of rest.

To restore the equilibrium it is well periodically to break away from the usual activities and engagements of busy life and seek rest and pleasure and the renewal of energy in freedom from duties perhaps too constantly and too strenuously discharged. This principle finds general recognition in the observance of the vacation season, in which custom, based doubtless upon the real necessities of our nature, calls workers from their tasks and charges them to seek recuperation, rest and enjoyment, with usually an opportunity to enter new scenes which give broadening as well as pleasure and health. The wise business man as he goes through life has other interests than those of his store or factory, and finds enjoyment and rest all through the busy years. Only thus can he respond adequately to the exacting calls which are made upon him. In addition to this, it is unquestionably the part of wisdom for him to lay aside entirely if he can for a longer or a shorter period the cares of business and take a real holiday. Having given ample recognition to the duty of work he should recognize as frankly the duty of rest. Having been perhaps unduly under the sway of Jupiter he should yield to the milder and health-giving influences of Saturn.

It is generally conceded that the dividing of large Hardware stores into various departments tends to simplify the carrying on of the business, and to secure greater efficiency in management, and, as a result, greater profit. An important part in this programme is the appointment of a department head who is responsible for the department and is expected to give to it his special attention and his best thought. One secret of the success of many a business is found in the fact that the various parts were developed by the specialized efforts of individuals, each of whom, having a responsibility limited to his particular field, was able to concentrate his abilities and energies upon it. An incentive was thus given to call out the best in him. It was up to him to make good in that department. Indeed, one of the questions which engages the attention of thinking merchants is how this principle, which gives such good results in large establishments, can be applied to smaller enterprises.

Condition of Trade.

The market is without particular new feature so far as prices and volume of business are concerned, the prevalence of warm weather, absence on vacation of buyers, salesmen and clerks, as well as proprietors, contributing to the quiet usual at this period. Beneath all is an undercurrent of hopeful anticipation relative to fall business. Some of the far-sighted wholesalers are busy getting stocks in shape and perfecting the organization of forces required to meet the demands of their customers. Information obtained from widely separated sections reflects a feeling of confidence as to the volume of business for the balance of the year. It is true that at present the demand is spasmodic, with intervals of slowness and activity, but on the whole orders aggregate well and are satisfactory in character. The continuing favorable reports on staple crops, reflecting a large yield on which high prices rule, give an almost ideal situation in these important factors. Some manufacturers report their plants working full time, with collections improved. The tariff seems to be in the way of settlement in the near future for the time being at least, and with the approach of autumn, with good crops practically assured, and a general expectation of a renewal of prosperity, the outlook is decidedly favorable. Some, indeed, are expressing the opinion that when the demand sets in it may be with much urgency, developing a scarcity of goods in some lines.

Chicago.

That the market is following a quiet and uneventful course just now is not to be construed in any respect as having a significant bearing upon the situation, or in any sense indicative of reaction. Relaxation from strenuous business effort is always a feature of the vacation period covering the months of July and August when so many members of store and factory organizations are away on their annual outings for rest and recreation. The quest for business is necessarily less energetic, since many salesmen are temporarily absent from their respective posts, and attention is now centered more upon the execution of old rather than the securing of new orders. Apart from the lull occasioned by these seasonable influences, developments are favorable to continued expansion. While it is too early to speak confidently of the crop situation, the reports of progress are as a whole encouraging. The forecast of a heavy corn crop contained in the Government crop report for July is of particular interest to the Middle West, where the success or failure of this cereal means much to the commercial and industrial interests of a broad area of territory. In following the diverging tendencies of trade in Hardware lines, it is noticed that a demand for special lines of tools and accessories has resulted from the remarkable expansion of the gas and gasoline motor industry that has taken place within the past few years and is still going on at a notable pace. While great impetus has been given to the construction and use of these types of motive power equipment by the wonderful growth of automobile building, it has been greatly augmented by the less conspicuous, perhaps, but none the less important demands from the builders of motor boats and agricultural machinery. Up to date Hardware stores are carrying not a few new tools, including special Wrenches and other appliances used in connection with the more standard types of such equipment; they are also finding through this channel a larger outlet for the regular line of engineers' tools and supplies. The tendency toward firmer maintenance of prices is being strengthened by the hardening of values in pig iron and the less finished lines

of iron and steel. In view of the late advance of 50 cents a ton on foundry pig iron and the relatively high price of scrap, Sash Weights are no longer obtainable at the low prices recently ruling. No important changes affecting price schedules of leading lines are reported, though in the opinion of the trade an advance on Wire and Wire products is likely to be announced before long.

St. Louis.

NORVELL-SHAPELIGH HARDWARE COMPANY.—Crop reports get better and better.

We are struggling with a good business and the vacation season. We wish all our salesmen and employees had taken their vacations in May, instead of waiting until July.

Up in northern Missouri some of our good friends and customers have been suffering from floods. The towns of Pattonsburg, Chillicothe and surrounding places are doing the modern Venice stunt.

It is too bad we cannot elect a national commission to regulate the distribution of moisture. In the same mail we receive letters complaining of droughts mixed up with letters from other sections complaining of a flood.

All the jobbers who write for *The Iron Age*—or most of them—are prone to give advice, so I guess we will have to go into the advice business ourselves. The poor retail merchant! How much gratuitous advice he has passed out to him! I wonder if he fully appreciates the deep interest that is taken in his success and welfare. Then I sometimes wonder whether all this advice is strictly disinterested.

Well, brothers in the retail trade, here is my advice, strictly from a selfish point of view: I think I see an exceptionally large business ahead of us. I believe the organizations of the Western jobbers will be taxed to the utmost in filling orders this fall. I believe there will be delays in shipments and shortages of goods. Right now, in what is usually the dull season, we are almost as busy as in some of our busiest months. How will it be when the regular fall business strikes us?

Jobbers cannot train their clerks in a week's time. In the midst of a rush untrained clerks are worse than useless—they are in the way. We therefore cannot increase our capacity for handling business simply by employing a lot of new clerks. These preparations must all be made months, not to say years, in advance.

Therefore, my advice—and I will say this advice is given from a motive of enlightened selfishness—to the retail trade is to buy their fall goods now and have them shipped immediately. Get the goods in your store. Mark them up now. Get the best fall datings you can from your jobber. Then when the fall business opens up you can devote your time to taking care of your trade and not be compelled to work far into the night marking up goods, with the result that you are worn out the next day.

Buying in this manner will also help the jobbers. It will distribute the business over several months instead of having it concentrated in the month of September. From what the visiting manufacturers tell us, jobbers are already buying and they are insisting upon immediate shipments.

We do not believe that this is a prosperity false alarm. We believe those retail merchants who follow these suggestions will have reason to thank us. What all of us need in our business is more looking ahead and more advanced preparation. Work of all kinds is multiplied when it is done under pressure at the last moment.

Now, having followed the example of the trade press in passing out advice free-gratis-for-nothing to everybody, we will resume the pleasant occupation of trying to catch up in the correspondence on our own desks.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—In our location there has been but little change in conditions of trade since our letter to *The Iron Age* July 1. In that letter we referred to the prevalence of rain and cold weather for a couple of months back having interfered somewhat with general business on certain kinds of goods; but we have had very warm and pleasant weather since that time, and the general feeling with the retail trade for the com-

ing months is very good, and, indeed, we see no reason why it should not be so, as things generally throughout the country look quite favorable. The wheat crop is reported as very fine, the corn yield is something wonderful, the oat crop is well spoken of, and the cotton prospect is fair. The Government reports on all these are very encouraging indeed, and no doubt appreciated by the country at large.

The tariff bill before the Senate has passed and will probably be adjusted within the next few days. We refer to this because a number of manufacturers are very desirous of having this matter closed up, so that anxiety may be ended.

From what we hear there appears no solicitude concerning selling prices by the manufacturers, jobbers or the retail trade, and that the financial condition of the country has certainly improved is shown by the banks and trust companies.

The situation is thus promising for the balance of the year, and the bad feeling that has existed for the last year and a half has been largely swept aside.

New Orleans.

WOODWARD, WIGHT & CO., LTD.—Our business holds up remarkably well for this portion of the year. We have had abundant rains and hot weather, which has placed crop conditions in good shape, particularly in the sugar and rice territory. Cotton planters, however, in Louisiana and eastern Mississippi are having a hard road. The prices continue to advance, but the prospect is for a very small yield.

There has been an increased demand for all grades of lumber, and many of the large yellow pine mills are now running on full time, and selling the best portion of their output in house building and house framing sizes. The demand for large timber, such as used for railroad and bridge construction, is not correspondingly as good. The feeling, however, among the lumber trade is better than it has been for some time.

Our sales for the first six months of 1909 are very much better than for the same period of 1908. The last half of the year is always the best and all conditions point to a very good fall and winter trade. We feel that we can afford to be optimistic as to the outcome for the balance of the year.

Recent bank statements show large deposits and healthier conditions than ever before. Our reports from the general retail trade indicate that they are confident of an improvement in trade during the half year now opening. Collections are coming in in very good shape. As September and October are the best months of the year in our line, and stocks now being carried throughout the State are not heavy, we look for a very brisk business for the next few months.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—As the days pass the disposition to await for further reports on the crops and for a final settlement of the tariff is less in evidence. Had the Hardware merchants of the country realized the extent of Senator Aldrich's power and known he would exercise it as he has it is more than likely the buying would have been more free and more money would have been made.

We read the discussion of the Razor schedule. Senator Smoot in his knowledge of the Razor business reminded us of the man Oliver Wendell Holmes told us about. The doctor, you will remember, was at first tremendously impressed with the man's fund of information, but later found him woefully lacking of any knowledge on any subject beyond G in the encyclopedia.

Any advance in present Razor duties will start new factories, increase present wages temporarily and lower the average quality of American product and 12 to 18 months will bring competition to the detriment of present manufacturers who would otherwise enjoy a continuance of their present steadily increasing prosperity and importance. In Razors quality is of more importance than price. Increased protection on Razors will bring American makers something against which they

cannot protect themselves—namely, the fierce domestic competition they are inviting.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business is holding up fairly well, but the continued rains throughout the Southern States are beginning to seriously affect crops, and we can already see that it is curtailing the placing of summer and fall orders. If we should have seasonable weather from now on we have no doubt that the crops in the South will be good, assuring a splendid fall business.

The market is in good shape. Pig iron is firm, with continued advances, and we look for a firm market on all iron and steel products the remainder of the year. The advance in leather during the past few months has been astonishing. All selections of leather are now considerably higher than they were before the panic, and saddlery and harness manufacturers are somewhat up in the air, and are getting out revised price-lists that will be quite an advance over former quotations. We find collections only fairly good.

The Builders' Hardware situation in Nashville is better than it has been for some time. There are quite a number of new buildings in course of construction, the principal ones being the million dollar Hermitage Hotel, Y. M. C. A. and Y. W. C. A. buildings, Union Bank & Trust Company and one which will be devoted exclusively to doctors' offices, with large drug store on first floor. There are also a great number of modern apartment houses and quite a large number of handsome residences.

Cleveland.

W. BINGHAM COMPANY.—At this time of the year we expect the general Hardware business to be a little quiet, as merchants and salesmen as a general thing take their vacations in the month of July. With the promise of a speedy settlement of tariff matters at Washington and the splendid outlook for business for the balance of this year, we believe by August 1 at least we will see quite a change for the better in business generally. By that time many salesmen will have had their vacations and will start in cocked and primed for the fall campaign.

The announcement of new prices on iron and steel merchant pipe making everything f.o.b. Pittsburgh is going to have a good effect on the pipe trade in all sections and will put aside many misunderstandings as to prices that have troubled so many of us in the last 60 days. We believe it is a move in the right direction.

From reports we are getting from manufacturers they are sharpening their pencils and readjusting prices to meet the times; that is, as far as material, labor and cost of production are concerned, and we look for quite a number of changes this month. The tendency seems upward rather than downward in the large majority of things.

We are having fine weather in this section and the farmers are busy getting in their hay, oats and other crops. Fruit of all kinds in this section bids fair to be a normal crop.

Mail order trade is very good, as it always is when the salesmen are off the road taking vacations, and the large business we get through our mail department proves that our efforts are appreciated by our many friends.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—As we come from the first half into the second half of the year we of the Pacific Northwest anticipate good business for the remainder of 1909. In fact, the writer believes that this feeling is universal along the coast. He had the pleasure last week of attending the meeting of the Pacific Coast Hardware and Metal Association at Tacoma, Wash., where jobbers were present from the entire coast, and he found them universally optimistic. At this meeting Andrew Carrigan of Dunham, Carrigan & Hayden, San Francisco, was elected president for the ensuing year.

With special reference to the conditions in Portland and immediate territory, business never looked better. Conditions are, as a whole, extremely favorable for good

crop yields, and we anticipate good prices for them. Money is fairly plentiful and our collections are excellent.

Omaha.

LEE-GLASS-ANDEESEN HARDWARE COMPANY.—This market, including other jobbing centers located on the Missouri River, presents no new or particularly interesting features at the present time. Business so far this year has been satisfactory and up to expectations. During the coming 30 days agriculturists will be busy in the fields harvesting the small grains. Corn looks very well on the uplands, but in the low or flat lands too much moisture has injured the plants as well as retarded their growth; consequently the result may show a shortage in volume of this important cereal.

The extent and value of the crops about to be harvested will be the main feature of importance having a bearing on the future trend of traffic and upon this will largely depend the extent of business during the autumn months. With crops of all kinds in fair supply, coupled with the present remunerative values, a continuance of a very satisfactory volume of business is predicted, and probably assured.

NOTES ON PRICES.

Wire Nails.—Mills are keeping up with deliveries fairly well on orders booked in the early part of May, of which there are many still unfilled. New contract orders, for delivery within 60 days, are being received in fair volume. Conditions in this line are very satisfactory, with a firm market and an impression, more or less general, that another advance in prices will take place sooner or later and possibly before long. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.70
Carload lots to retail merchants.....	1.75
Less than carloads to jobbers.....	1.75
Less than carloads to retail merchants.....	1.85

New York.—Wire Nails are moving in moderate quantities, with considerable steadiness in the local market. The New York price of \$1.90, base, followed the reduction of price to jobbers of \$1.60, base, f.o.b. Pittsburgh, which was in force in the early part of May. As these stocks of low price Nails in the hands of local jobbers are becoming exhausted the market has assumed a firmer tone. As a result Nails are held in small lots at store on the basis of \$1.90 to \$2 per keg.

Chicago.—A moderate amount of new business is being entered, but the principal tonnage coming to the mills is in specifications against contracts. These are being turned out as rapidly as possible, and the mills are not falling further behind on deliveries, which are prompt enough to meet all but the most urgent requirements. Buying for the fall trade is expected to open up in the South before the end of the month, and following the usual custom it should begin in the Northern States early in August. The present crop outlook favors the expectation of a heavy trade for the latter half of the season. No intimation of what price basis will be established for fall deliveries is given, but the general trend of values in other divisions of the iron and steel market seems to confirm the belief that it will be higher than at present. We quote \$1.88, Chicago, in car lots to jobbers and \$1.93 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—General conditions in the Wire Nail trade continue very satisfactory, the mills entering a fair amount of new business at current prices, while shipments against specifications on contracts taken prior to May 15, when prices were advanced \$2 a ton, continue quite heavy. The mills still have a good many unfilled orders on their books taken at the \$1.80 price, and also have considerable new business taken at \$1.70, and buyers are specifying quite freely. Contracts have recently been closed with a number of leading jobbers for delivery within the next 60 days, and the leading Wire Nail mills are running to full capacity. There is still some

talk in the trade of an early advance in prices, but it is hardly believed this will be made before August or probably September, or about the time that fall trade opens up. The tone of the market is very strong, and we quote Wire Nails at \$1.70 per keg in carload and larger lots, f.o.b. Pittsburgh.

Cut Nails.—Following the closing down of Cut Nail mills for the annual inventory and repairs, the fact has developed that manufacturers are bare of stocks to such an extent that some cannot fill large orders now on their books for 10 days or more. One mill is reported as having made the statement that there was no money in making Nails at present prices. Specifications against contract orders are in excess of the volume of new business received by the mills. Prices are not maintained at the regular quotation of \$1.80 base, f.o.b. Pittsburgh, but are subject to concession of about 10 cents per keg. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

New York.—Owing to the closing down of a number of the Cut Nail factories for annual repairs and inventory, a temporary scarcity of some sizes has developed in the local market. There is a fair demand for some of the larger sizes for structural work. Cut Nails are held on the basis of \$1.90, in small lots at store.

Chicago.—The demand for Cut Nails is increasing, but the mills are still short of orders necessary to keep them going at full capacity. The market is growing firmer and prices are less irregular. There is little, if any, shading of current quotations, which are as follows: In car lots, to jobbers, Steel Cut Nails, \$1.88; Iron Cut Nails, \$2.03.

Pittsburgh.—A moderate amount of new business is being placed in Cut Nails and mills report that specifications against contracts are coming in quite freely. The tone of the market is firmer and concessions are more difficult to obtain than they were some time ago. The regular price of Cut Nails is \$1.80 per keg, base, f.o.b. Pittsburgh, but this price continues to be shaded about 10 cents per keg. There is a differential in price of Iron Cut Nails over Steel Cut Nails of about 10 cents per keg, but very few Iron Nails come into this market.

Barb Wire.—Business is following its usual course in the Barb Wire market at this season, the mills being occupied almost entirely in filling contract orders. Prices are well maintained at regular quotations, which are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.	
Jobbers, carload lots.....	\$1.70	\$2.00	
Retailers, carload lots.....	1.75	2.05	
Retailers, less than carload lots.....	1.85	2.15	

Chicago.—New buying is about wound up for the present season, but the volume of shipments going forward in execution of existing contracts is large. These will probably keep mill capacities pretty well engaged until buying for the new season begins, which will probably not be later than August 1. Prices continue firm and unchanged. We quote as follows: To jobbers, Chicago, car lots, Painted, \$1.88; Galvanized, \$2.18. To retailers, car lots, Painted, \$1.98; Galvanized, \$2.28; retailers, less than car lots, Painted, \$2.03; Galvanized, \$2.33. Staples, Bright, in car lots, \$1.88; Galvanized, \$2.18; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New business is light, as it always is at this season of the year, but the mills are still making deliveries on contracts taken prior to May 15, when prices were advanced \$2 a ton; also on a few orders placed after this advance was made. We are advised the market is firm and we quote Galvanized Barb Wire at \$2 a ton, Painted at \$1.70, in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Plain Wire.—Mills are freely employed filling orders taken early in May, and shipments are consequently heavy. The outlook for a heavy fall demand for Wire is regarded as encouraging in view of large crops. The market is firm and quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of \$1.50 for Plain

and \$1.80 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Now.....	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....	\$1.50	1.55	1.60	1.65	1.75	1.85	1.95	2.05
Galvanized.....	1.80	1.85	1.90	1.95	2.05	2.15	2.55	2.65

Chicago.—Contracts for a fairly large tonnage of Plain Wire are being entered for future delivery. Current prices apply on shipments 60 days ahead, but an advance of \$1 a ton is asked for contracts covering deliveries through the remainder of the year. Conditions seem to be favorable to the development of a heavy demand. Prices are being firmly maintained. We quote as follows: Car lots, to jobbers, \$1.68, base, f.o.b. Chicago.

Pittsburgh.—The mills still have a large amount of business on their books, most of which was taken prior to the advance in prices on May 15, against which buyers are specifying freely, and shipments by the mills are heavy. There is still an impression that prices of Wire may be advanced before long, but it is the general opinion that this will not take place for a month or two yet. A heavy fall demand is expected for Fence Wire, as with big crops this season Fence building by the farmers will be active. The market is firm, and we quote Plain Wire at \$1.50 and Galvanized at \$1.80 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Market Wire.—In the revision of prices, incident to changed conditions in raw material, manufacturers have made changes in the discounts applying to Market and Stone Wire, so that current prices are represented by the following quotations:

Bright and Annealed.

	Discount.
9 and coarser.....	.80 %
10 to 18.....	80 and 10 %
19 to 26.....	80 and 10 and 2½ %
27 to 36.....	80 and 5 %

Galvanized.

9 and coarser.....	75 and 10 %
10 to 14.....	75 and 10 %
15 and 16.....	75 and 10 %
17 and 18.....	72½ and 10 %
19 to 26.....	72½ and 10 %
27 to 36.....	72½ %

Coppered.

9 and coarser.....	75 and 10 %
10 to 14.....	75 and 10 %
15 to 18.....	75 and 10 %
19 to 26.....	75 and 10 %
27 to 36.....	70 and 10 and 5 %

Tinned.

6 to 18.....	75 and 10 and 10 %
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Dripping Pans.—In this line irregularity of prices is prominent, these being badly demoralized owing to the keen competition between some of the manufacturers. There appears to be no indication of any immediate improvement in the situation.

The Hawkeye Wrench.—The Hawkeye Wrench Company, Marshalltown, Iowa, has made a reduction in the price of its Wrench to \$3.25 per dozen, which went into effect July 1. Heretofore the Wrench has sold at \$4.00 to \$4.50 per dozen.

Agricultural Wrenches.—The manufacturers of Agricultural Wrenches, which have been low and irregular, are now holding them at higher prices. Full case lots may now be quoted in a general way at a discount of about 80 and 5 per cent.; less than full cases at discount of 75 and 10 per cent.

Window Glass.—According to a revision in the estimates of the number of Glass plants in operation, it appears that there are 17 hand plants making Glass, with a total capacity of about 600 pots. It is supposed, barring accidents to tanks, that these will continue in operation during the present month, and that some will operate throughout the summer. The production and sale of Glass during the present fire are now regarded by some who are in close touch with conditions as about equal, and it is believed that stocks in the hands of manufacturers and merchants are moderate. The opinion has been expressed at different times within the past year that the supply of Glass in manufacturers' hands was larger than desired by them. The demand continues in

about the same volume as for some weeks, which is in accord with midsummer quietness. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains are as follows: New England States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory shipments, Single, 90 and 45 per cent.; Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts 5 per cent. better than other States; in the Southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 to 90 and 45 per cent. on Double, from jobbers.

Rope.—General conditions in the Cordage market remain without noticeable change. The demand continues moderate in volume and as a rule represents no more than early requirements. Prices are regarded as well maintained on the highest grades of Rope, while mixed goods are not so firm under all conditions. The market may be represented by 8½ to 8½ cents per pound, base, for Pure Manila of the highest grade and a corresponding quality of Sisal at 7½ to 7¾. Lower grades of Pure Manila, ¼ cent less than the foregoing quotations. Second grade Sisal is quoted at 6½ cents and third grade at 6 cents per pound. Jute, ¼ in. and up, No. 1, is quoted at 6½ to 6½ cents, and No. 2 at 5½ to 5¾ cents.

Linseed Oil.—The large stocks of Linseed Oil in this country are held by, perhaps, three or four crushers, some of whom appear to prefer to shade regular quotations 2 or 3 cents per gallon on carload business, instead of holding on to their stocks. There is said to be a good profit to crushers at the lower prices of 57 to 58 cents on the basis of Western Raw, and new business at regular prices is very light. In fact the lower quotations have not increased the demand to a great extent. Withdrawals on contract orders are also slow. Local business for small lots is comparatively light. Quotations for 5 bbl. or more are as follows: State and Western Raw, 60 cents per gallon; City Raw, 61 cents per gallon, with the usual advance of 1 cent for less than 5-bbl. lots. Boiled Oil, 1 cent advance on Raw.

Spirits Turpentine.—Prices during the week have had an upward trend, the net result being 2 cents advance on last week's quotations. A large export demand at Savannah is given as the reason for the stronger market. The New York market is represented by the following quotations: Oil Barrels, 49 to 49½ cents; Machine Made Barrels, 49½ to 50 cents per gallon.

AMONG THE HARDWARE TRADE.

Hopkins & Son, Rossville, Kan., have sold their Hardware, Stove, Implement, Paint and Sporting Goods business to W. O. Skaggs.

Wallace & Slead have succeeded to the Hardware, Stove, Housefurnishing, Paint and Sporting Goods business of Wallace & Sons Company, Overton, Neb.

An application for a Pennsylvania charter has been made by the Kinkerter & Sheppard Company, Philadelphia, handling general hardware.

The Greenville Hardware Company, Greenville, Miss., has sold its entire stock of goods to the Hood-Sharkey Company of the same place.

S. P. Himes has purchased the Hardware business of Hoke Bros., in Warrensburg, Mo.

The Farmers' Supply Store, J. J. Van Bruggen, manager, has bought the Hardware and Implement business of L. F. Dorr, Uniontown, Wash.

M. E. Power has purchased the business of Hill Brothers, Hudson, Mich., and is carrying Shelf Hardware, Stoves, Tinware, Window Glass and Sporting Goods.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Pricing Malleable Iron Fittings.

We have received the following reply to the inquiry for "the best arrangement for price cards or price books of Malleable Iron Fittings for use in charging for work done in the shop, and also for retailing in the store":

FROM NEW JERSEY: While the plan submitted herewith for a price-list of Malleable Iron Fittings does not carry out the idea of the New York State merchant, as noted in your issue of June 24, of grouping them in classes, "not in respect to their names or nature," it may suggest some ideas which will go toward solving the problem.

This method of grouping contemplates putting the sizes of Fittings across the top of the list and the names down the left hand side. The figures 1 to 6 in the squares represent the group prices. Thus a ½-in. Bushing would be sold at 3 cents, a 1-in. Union at 15 cents, &c. As salesmen familiarize themselves with the prices represented by the

	1/8	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2
Bushings	1	1	1	1	2	2	2	2	2
Crosses	1	2	3	4	5	5	5	6	
Elbows	1	1	1	2	2	3	4	5	
Plugs	1	1	1	1	1	1	2	2	
Tees	1	1	1	2	2	3	5	5	
Unions	3	3	3	4	4	5	5	6	

Price-List of Malleable Iron Fittings as Used by a New Jersey Merchant.

group numbers, and as the size and kind of any Fitting can be quickly and easily located, the price would be promptly indicated by the group number. This would prove particularly advantageous when an impatient customer was waiting to know the amount of his purchase.

In making a price card the list could be enlarged beyond the six-group limit, along the same lines, to accommodate a more extended range of Fittings and larger sizes. The cost of each item could easily be figured from the "pound list" and marked in the appropriate square, in cost mark characters, along with the group number. Price cards so arranged can be exposed without customers or competitors being any the wiser as to cost or selling prices.

It will be understood by the salesmen that the prices of the various groups are as follows:

1 = 3c. each net. 4 = 10c. each net.

2 = 5c. each net. 5 = 15c. each net.

3 = 7c. each net. 6 = 20c. each net.

Handling Claims Against Railroads for Damage to Goods in Transit.

We have received the following replies to the question: "How should claims against railroads for damage to goods in transit be handled so as to secure a fair and prompt adjustment?" One or two of our correspondents refer to encountering but little difficulty in this direction, but others describe the process of adjustment as very slow:

FROM OHIO: We invariably have notation made on expense bill at freight house by a recognized employee before accepting same. This with the original bill of lading and invoice constitutes a valid claim and meets with prompt adjustment.

FROM WASHINGTON, D. C.: We have very little difficulty in collecting claims against the railroads for goods damaged in transit. It is true we find some roads are more prompt in settling than others, and none are as prompt in making settlements as we would like to find them. The course we pursue in entering claims is such as the railroads require, and we presume such as followed by other claimants—that is, file the original bill of lading and invoice of the goods and bill for our claim.

FROM MICHIGAN: Our claims are generally settled when they are finally ground through the mills of the railroad companies, which grind exceeding slow. We do not know of any way to hasten matters. The railroads have their troubles and they seem to us to be desirous of settling all just claims.

FROM VIRGINIA: We hardly know how to answer this question. We have two railroads here, the Norfolk & Western and the Baltimore & Ohio. The former will pay claims in 30 to 60 days; the latter in 6 to 12 months. We think a great deal depends on the agent being prompt in forwarding and looking after them. As a rule these claims are so small that we do not care to get into litigation over them, but we really think that after 60 days the claim should be placed for collection. Why should a railroad company owe a shipper when it demands pay in advance or on delivery?

White Lead Manufacturers Selling Direct to Consumers.

Other letters touching on the practice of manufacturers of White Lead selling to consumers are given below. This line is evidently handled with a good deal of dissatisfaction by the trade:

FROM NEW JERSEY: There are too many in the business who have no idea of right and wrong. They might agree to a reasonable profit on White Lead, but would not stick to it.

FROM CONNECTICUT: The conditions affecting the sale of White Lead are and always have been very discouraging to the dealer. He is forced to sell it at a profit that hardly pays for carrying the stock. The interest on the money invested, cost of handling, the risk, all contribute to make it an unprofitable article for the dealer. If merchants would refuse to stock it it might bring the manufacturer to his senses.

FROM MINNESOTA: We regard the policy as all wrong. My advice would be to cut out White Lead altogether and let the manufacturer look to the consumer entirely to market his product.

FROM OHIO: It is, of course, an unfair proposition, and we believe that if any dealer who suffers will make written complaint to the secretary of his State Hardware Association, giving names and dates, quantities, &c., that abuses of this kind can be stopped. We have found this to be very successful.

FROM WISCONSIN: Would cut out the sale of Lead made by manufacturers that pursue such tactics.

FROM ILLINOIS: We solved this question long ago. We turned over all of the White Lead business to the manufacturers and second rate dealers who care to invest their capital with the hope of making a small margin of profit, and are educating our trade to the use of Mixed Paints where we are able to make a profit and with just as much satisfaction as if we sold White Lead.

FROM IOWA: The situation of the White Lead people selling direct to the consumer is not unlike many other lines being sold direct to the consumer—for instance, Builders' Hardware, Roofing, Paints, Sewer Pipe, &c. The dealer is simply being crowded out and must take his medicine.

FROM NEW JERSEY: It is an outrage for dealers to put up with the method of White Lead manufacturers' selling to consumers direct at virtually the same cost as to dealers. They make a slight distinction which is unworthy of dealers' attention. Every dealer should combine and absolutely cease to handle White Lead and compel Lead manufacturers

to assume all accounts, good, bad and indifferent, which dealers are compelled to assume at great loss. Every dealer who handles Lead and Oil knows that this class of trade is the tail end of the rope and unsafe for credit. Any man that can handle a brush calls himself a painter and starts out to contract work without any reasonable backing whatever.

Obituary.

Benjamin F. Eshleman.

COL. B. F. ESHLEMAN, vice-president and general manager of Stauffer, Eshleman & Co., New Orleans, La., died at Narragansett Pier, R. I., July 6, in his eighty-first year. He had been in poor health for some months, but was not thought to be dangerously ill.

Benjamin Frank Eshleman was born on his father's estate near Lancaster, Pa., in 1830. When 16 years old, dissatisfied with farming, he entered the employ of John F. Steinman, Lancaster, with whom also his uncle, I. H. Stauffer, had learned the Hardware business, subsequently going South to engage in the same line. Mr. Stauffer had been established in business in New Orleans for a period of 15 to 20 years when, coming North in



COL. B. F. ESHLEMAN.

1850 on a visit, he was attracted by the manifest business ability of his nephew. He accordingly took him to New Orleans and secured a position for him in what was then Slark, Day, Stauffer & Co.

At the outbreak of the Civil War, espousing the cause of the South, Mr. Eshleman joined the Washington Artillery and became an officer and eventually the colonel of this famous organization. At the close of the war he returned to New Orleans and his former employment, the firm having become Slark, Stauffer & Co., of which he shortly became a member. He was regarded then and until his death as one of the best posted and most practical Hardwaremen in the country, having frequently been called on to testify as an expert in matters requiring a technical knowledge of the business. When the firm became a limited corporation in 1905 he was made first vice-president and general manager.

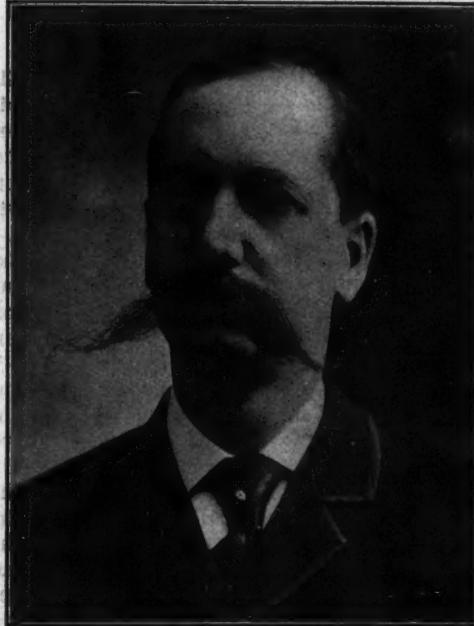
Colonel Eshleman was descended from an old colonial family of sterling worth. By nature and character he was a gentleman, and it has been said of him, quoting Emerson, "that had not manners already been in use he would have invented them." He was a charter member of the Pickwick Club, a member of the Mystic Krewe of Comus, a member of the Boston Club, and at one time served as president of the Board of Trade. He was also prominent in the National Hardware Association and the Southern Hardware Jobbers' Association.

James Surpless.

AMES SURPLESS of Surpless, Dunn & Co., New York and Chicago, died July 7 at his home in Brooklyn, N. Y. He was born in New York City April 21, 1850, of Irish-English parentage, being a son of the late John and Eleanor Surpless, but had resided in Brooklyn for more than 40 years.

Mr. Surpless had been in the Hardware business for the past 35 years, being first employed by Sargent & Co., and afterward a partner in the firms of T. P. Burke & Co. and J. C. McCarty & Co. In 1889, with Robert M. Dunn, he established the firm of Surpless, Dunn & Co., and in 1892 his eldest son, Oliver B. Surpless, became a member of the firm. Ten years later another son, James Surpless, Jr., was admitted to the co-partnership. During the past few years Mr. Surpless had not been active in the business, and in 1906 became an advisory partner, Oliver B. Surpless, the eldest son, becoming senior member of the firm.

Mr. Surpless was a thirty-second degree Mason, a constituent member of Kismet Temple, Nobles of the Mystic Shrine; a member of Acanthus Lodge, F. & A. M.; Clinton Commandery, K. T.; Stuyvesant Council, R. A., and the Society of Old Brooklynites. He was also a trustee of the East Brooklyn Dispensary, with the late Darwin R. James and the late Thomas J. Atkins, who were his associates in the Throop Avenue Presbyterian Church.



JAMES SURPLESS.

Mr. Surpless leaves a second wife, to whom he was married in 1906, and five sons, one of whom, Thomas J. Oliver, represents the Sixth Assembly District in the New York Legislature.

Daniel K. Stucki.

D. K. STUCKI died at Beaumont, Texas, July 1, while waiting in the lobby of the Crosby House for a train. The immediate cause of death was a hemorrhage of the lungs and he was dead in 10 min., but this, it is believed, was in part occasioned by a piece of orange that had lodged in his throat, as disclosed by a post-mortem examination.

Daniel Kemp Stucki was born in Buffalo, N. Y., July 28, 1869, and had been selling Hardware as a manufacturer's representative on the road for 21 years. He covered the South from the Atlantic States to the Southwest, including Texas, Arkansas and adjacent territory. He represented approximately a dozen prominent houses, among which were the Buffalo Forge Company, White Mountain Freezer Company, Buffalo Mfg. Company, Indiana Shovel Company and Vaughan & Bushnell Mfg. Company. His early life was spent in Buffalo, and after

his school days he went into the law office of C. B. Hill, where he remained until he began traveling, at about the age of 18.

Mr. Stucki was an active member of the Old Guard Southern Hardware Salesmen's Association, and chairman of its Executive Committee. He was recently elected president of the Hardware Manufacturers' Agents' Association, organized during the joint conventions at Pittsburgh of the Southern Hardware Jobbers' and American



DANIEL K. STUCKI.

Hardware Manufacturers' associations. He was always active at the National and Southern jobbers' conventions, and for years was on the Entertainment Committee of the latter.

He possessed a host of friends in business and social circles who greatly admired and esteemed him for his sterling worth, and his popularity with traveling men in Hardware lines is manifest from the various positions of honor and trust accorded him. He had been almost a father to two younger brothers, whose education he financed, one of whom was recently graduated from Princeton and the other from Cornell several years ago, but who died of typhoid fever soon after graduation.

THE business of the Sportsman's Supply Company, Cleveland, Ohio, has been consolidated with the Lockwood-Luetkemeyer-Henry Company. Attention is called to the fact that while there has been a change in the ownership there will be no change in the local management of its various departments and T. C. Larmer, former manager of the Sportsman's Supply Company, will continue in charge as manager of the sporting goods department of the Lockwood-Luetkemeyer-Henry Company.

THE NIMMO FENCE & WIRE WORKS COMPANY, Cincinnati, Ohio, has been taken over by the H. L. Brown Fence & Mfg. Company. The new company will deal with the jobbing trade exclusively and none of its product will be sold direct to the consumer. The capacity of the plant has been enlarged to meet the growing demand for the Norwood Wire Fencing, Ornamental and Farm Gates, Settees and Tree Guards.

THE RUHMANN HARDWARE COMPANY, Kenedy, Texas, incorporated with a paid-up capital of \$20,000, has been organized by E. P. Ruhmann, S. C. Ruhmann and Levi Pullin. E. P. Ruhmann is manager of the concern, which will deal in Paints, Oils, Windmills, Water Supplies, &c., and will operate a tin shop in connection.



Quiet Work.

One lesson, Nature, let me learn of thee,
One lesson which in every wind is blown,
One lesson of two duties kept at one
Though the loud world proclaim their enmity—

Of toil unsever'd from tranquillity;
Of labor, that in lasting fruit outgrows
Far noisier schemes, accomplish'd in repose,
Too great for haste, too high for rivalry.

—Matthew Arnold.

Strictly for Clerks.

BY CLARFIELD.

A mighty fetching advertisement was recently published by a correspondence school with the caption, "What Will You Do at Sixty?" Regardless of the merit of the advertisement, the question itself is worth thinking about. How long do you expect to be a clerk? Or, if you expect to be a clerk all your life, how long do you expect to remain at your present salary?

This article is not intended for the "boss." Still he is very likely to see it before he passes *The Iron Age* along to the clerks. Therefore, it might be mentioned also that this article is not intended to set the clerks on the warpath with a "touch" for a raise.

By the way, does the "boss" pass *The Iron Age* along to the clerks in your establishment? If he doesn't do it, you will place yourself one notch higher in his estimation by getting after him and asking him to do it.

Straight Talk to Young Men.

Some of these questions may seem rather personal, but this is meant to be a straight-from-the-shoulder talk to the man behind the counter. It would not be printed if there were not a possibility of its doing him some good. Still its possibility of good does not lie in the article itself. It lies with the clerk who reads it, the use that he makes of it and the train of thought that it may arouse in his mind.

Some Men Too Mechanical.

The proprietor of one of the largest retail houses in New York said the other day that he could afford to pay 50 per cent. higher salaries if he could get hold of men who possessed judgment and initiative. Do you know what that means? It means the power to do the right thing at the right time. This merchant said that most of his young men were too mechanical. They learned to do certain things in the earlier days of their experience, and they did those things over and over and over in a mechanical way each day. They fail to put thought and study into their work. "That's the reason," continued this merchant, "that there is always room at the top. We find it more difficult to fill satisfactorily one \$5000 position than it is to fill 10 \$800 positions."

The reason is obvious; young men in business are too mechanical. They don't take the trouble to prepare themselves for better positions.

Another Merchant's Word.

Another merchant in New York recently hired a young man for an executive position at a salary of \$3500 per year. This young man had been at work about a month when the two were having a talk one evening

regarding the policy of his department, and the young man referred to the method employed in a similar department of a larger store. "They pay \$2000 a year for an assistant up there," said the young man, "and they also pay the best prices for piecework, so that the manager has only the finishing touches to do and the rest of his work is largely supervision." "Pshaw,"

Value of Initiative. was the reply, "that's one way of doing things, but you can do anything with money. What we want is to accomplish the same thing without spending nearly as much money. Give me the man who can do things! I got you because I thought you had initiative. So far you are working out all right, and if you continue you need have no worry about your future. When our business reaches larger proportions you will be relieved of a great deal of detail, but even then I feel that we can accomplish practically what the other concern is doing at a great deal less expense."

The Modern Demand.

These remarks are straws that show which way the business wind is blowing. The great merchants want men of action; men who think; men who watch the work—not the hours. RESULTS count!

Don't be an automaton. Don't be too dependent upon others. Remember the old saying—"The more oversight, the less pay."

Persistency Landed the Job.

Some years ago when _____ was city editor of the New York *Herald* he was frequently solicited by a persistent youngster who sought assignment as a reporter on the staff. Rebuffs more or less marked in no way disheartened the indefatigable applicant, who kept at it everlasting. One inclement day, varying his custom of calling at the office, he telephoned from Newark, N. J., his home, making the stereotyped request, which the busy editor on the instant did not associate with his familiar visitor, but as his identity dawned on him he said impatiently, "Go to h—." Instantly the answer was Pictures from Hades. flashed back, "Shall I get pictures?" The nimble wit of the tireless cub, who, on the spur of the moment assumed that finally he had been "assigned" to cover important territory, caught the astute editor, who detected ability and embryonic conception of a "beat," and reversing himself on the spot, directed him to call and later engaged him. The young man made good as a reporter and his advancement since in other directions has been so marked that in the last edition of "Who's Who" more space is given up to a description of his career than is occupied by his former superior, who is now one of the principal owners of a great metropolitan journal and a man of much weight and influence in the community.

In furtherance of plans to increase its business by the addition of new lines and the carrying of larger stocks, the Barrett Hardware Company, Joliet, Ill., is erecting a new four-story and basement store building 66 x 150 ft. A feature of the first floor arrangement will be the liberal display of goods on tables and stands not exceeding 5 ft. in height, which will occupy a large portion of the space in the main salesroom. The general Hardware stock will be displayed in wall cases placed on one side of the room, but the use of tables as indicated will, besides affording more general exhibition of the lines, permit an unobstructed view of the entire store. The front portion of the second floor will contain a display room for plumbing and heating goods and samples of Builders' Hardware. Its advertising value will be enhanced from the fact that the windows in this room will all be low enough to allow their contents to be seen from the opposite side of the street as well as from the street cars. The rear portion of this floor will be occupied as a plumbing, heating and sheet metal shop, which will be equipped with modern tools and supplied with a large stock of Valves, Pipe Fittings, Eaves Trough and Spouting and kindred lines.

THE CAROLINAS HARDWARE CONVENTION.

In the telegraphic report which appeared in last week's issue reference was made to the proceedings of the first day's sessions of the three-day annual convention of the Retail Hardware Association of the Carolinas at Asheville, N. C. The meeting was held at the Battery Park Hotel, was largely attended by the members as well as by representatives of manufacturers and jobbers, and proved to be an exceptionally interesting and successful gathering.

The convention afforded abundant evidence of the success of the administration of President Duvall and his associates. During the year there was an increase in the membership of about 75, some of the new members giving promise of much interest in the work of the organization, thus taking their place with those whose efforts had resulted in giving it its present strong and influential position. In addition to this the finances of the association have been put on a good basis and the regular income is sufficient to meet all requirements.

President Duvall expressed much gratification that this eminently desirable result had been accomplished, making generous acknowledgment of the hearty co-operation of the officers in making and carrying out plans to this end, and also of the liberality of the membership in meeting cheerfully the special demands made upon them. The association certainly enters upon another year under very favorable auspices, and its further progress and increased usefulness are anticipated.

Entertainment at Asheville.

The arrangements for the convention were admirable and the comfort and pleasure of the delegates were carefully looked after. The chairman of the local committee, Ottis L. Green, was unremitting in his attention and extended to the members and visitors many courtesies.

goods or talking to the trade and gave their entire attention to the proceedings during the open sessions, and cheerfully withdrew from the room during the executive sessions. The interests of the exhibitors were also carefully safeguarded, as abundant opportunity was given to the merchants to inspect them. The exhibits were arranged on all sides of the room and furnished a unique setting for the deliberations. This suggested to one of the speakers the following parody on "The Charge of the Light Brigade," to whom were facetiously compared those who at the command of President Duvall addressed the large assemblage of merchants:

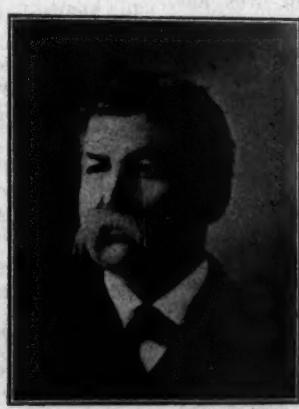
Hardware to right of them,
Hardware to left of them,
Hardware in front of them,
 Oh, how it glistened;
 Stared at by Saws and things,
 Spake they wise words with wings
 On the great themes of trade,
 How fortunes may be made,
 All the merchants listened.
 Oh, the great talks they made,
 Oh, the wise words they said,
 No wonder merchants listened.

Collection of Bad Debts by Law.

An interesting address was made on Tuesday afternoon by Hon. W. S. Hall, Gaffney, S. C., on "The Col-



A. L. PHIPPS.



W. H. SMITH.



OTTIS L. GREEN.

While the weather was such as to prevent the carrying out of some of the plans for outings made by his committee, the stay of those attending the convention was very much enjoyed.

The Battery Park Hotel, in which the convention met, was found admirably adapted to the requirements of the association. It was a great convenience to have the delegates and guests all under one roof, as well as the meetings and the exhibits. The ample lobbies, parlors and verandas afforded excellent opportunities for social converse. The weather, which was rainy, unfortunately prevented the carrying out of plans made by the local committee for the session in Overlook Park, which occupies a commanding place on the mountain. The committee had made special arrangements to make this outing for combined business and pleasure notable and enjoyable.

The Exhibits and the Meetings.

The meetings were, as we have already announced, held in the same hotel as were the exhibits. The arrangements, however, were so admirable that there was not the slightest disturbance during the sessions of the convention. The exhibitors refrained from showing their

lection of Debts by Law." Mr. Hall, whose presence at the convention was very much appreciated, was obliged to leave the city by an early train, so that the time at his disposal was somewhat curtailed. His address was interesting and suggestive and decidedly practical. Among the points which he emphasized were the following:

1. That all claims which will need to be collected by legal process should be put in the hands of attorneys as soon as possible.
2. That it is advisable to handle claims through an attorney rather than through a collection agency, because there is something special and peculiar in almost every case.
3. That it is not wise to let a debtor think that you suspect his honesty.

Fire Insurance.

One of the most important topics before the convention was the matter of Hardware fire insurance. This subject, it will be remembered, was prominently discussed at the meeting at Wrightsville Beach last year, where a committee was appointed to consider the matter with especial reference to the feasibility of forming

an insurance company incorporated in one of the Carolinas. It was not found practicable to do this as yet, but the members of the association manifested a disposition to avail themselves very generally of the opportunity to secure insurance in the National Company or in some of the State companies. The whole subject was presented fully and with characteristic clearness by W. P. Lewis, Huntington, Pa., secretary of the National Company and also of the Pennsylvania Company. The indications are that a good deal of insurance will be placed by the members of the association of the Carolinas with one or more of the Hardware mutuals.

A. L. Phipps' Address.

One of the best addresses made before the convention was that of A. L. Phipps of Durham, N. C. His subject was "What Is to Be Accomplished by United Effort?" His suggestions were not limited to the work of the State or national associations, but related also, and very forcibly, to the work which may be done in each community. We hope to give the substance of his excellent remarks in a subsequent issue.

Lien and Collection Laws.

The subject of collection and lien laws in the Carolinas was carefully considered by the convention at more than one session. Reference was made to the good work done before the legislatures by the representatives of the association. A pamphlet containing the text of the South Carolina law relating to liens on laws and buildings for labor and materials was distributed, and the rights and privileges of merchants were explained at length. In connection with this general subject was the address of Hon. W. S. Hall of Gaffney, to which reference is elsewhere made.

The New Officers.

According to the usage of the association the president is not to be re-elected, and the name of E. Walter Duvall, who presided through the convention, was not presented for another term by the Committee on Nominations. A resolution very heartily commending him and his associates was passed by a unanimous vote.

The first vice-president, R. H. McDuffle, Fayetteville, S. C., was elected to the presidency, W. H. Smith, Gaffney, S. C., becoming first vice-president, and A. L. Phipps of Durham, N. C., second vice-president. T. W. Dixon, Charlotte, N. C., was re-elected secretary-treasurer, his work having been exceedingly satisfactory during the convention, giving constant attention to the duties of his office and in extending courtesies or furnishing information to the members as opportunity presented.

The new president has been active in association matters from the first and is regarded as having excellent qualifications for his office, so that a year of progress and usefulness is confidently expected for the association under his leadership. He is regarded as a worthy successor to President Duvall, who is exceedingly popular personally, made a most excellent presiding officer and gave an administration which was notably successful.

Place of Next Meeting.

A cordial invitation was extended to the association to meet next year at Asheville, but it was thought desirable to hold the meeting in South Carolina, and a very earnest invitation from Charleston was accepted after considerable debate by a unanimous vote. It is believed that with the characteristic hospitality of that city a very hearty welcome will be extended to the next convention, and the opinion was expressed that there would be a record breaking attendance.

Standing and Convention Committees.

The standing and convention committees, as given in the Year Book of the association, were as follows:

GRIEVANCE: Arthur Craig, Marion, S. C.; F. B. McKinney, Louisburg, N. C.; J. W. Smoak, Orangeburg, S. C.

NOMINATING: W. N. Everett, Rockingham, N. C.; E. O. Rogers, Florence, S. C.; G. L. Bernhardt, Lenoir, N. C.

RESOLUTIONS: Jas. H. Burns, Camden, S. C.; U. B. Blalock, Wadesboro, N. C.; N. F. York, Concord, N. C.

PRESS: Elliott Dunn, Atlanta, Ga.; G. A. Baxter, St. Matthews, S. C.; A. E. Lloyd, Durham, N. C.

EXHIBITS: Ottis Green, Asheville, N. C.; W. W. Watt, Charlotte, N. C.; J. H. Craig, Blackstock, S. C.

AUDITING: M. Bonnolt, Darlington, S. C.; J. H. Burns, Camden, S. C.; A. W. Welling, Marion, S. C.

REVISION OF CONSTITUTION AND BY-LAWS: M. Bonnolt, Darlington, S. C.; J. H. Bennett, Clio, S. C.; S. W. Richardson, Wilson, N. C.

SOCIAL: Wm. H. Smith, Gaffney, S. C.; John A. Desportes, Columbia, S. C.; Fred L. Smyre, Gastonia, N. C.

INSURANCE: T. O. Flowers, Rock Hill, S. C.; N. F. York, Concord, N. C.; U. B. Blalock, Wadesboro, N. C.

MEMBERSHIP: Active—Jos. N. Jacobi, Wilmington, N. C.; H. Suydam, Columbia, S. C.; G. Betts Simmons, Charleston S. C. Associate—M. C. Thompson, Charlotte, N. C.; Chas. T. Williams, Richmond, Va.; F. R. Eldridge, Baltimore, Md.

Exhibitors.

Manufacturing concerns represented and exhibiting at the convention were as follows:

E. C. Atkins & Co., Indianapolis, Ind.
Simonds Mfg. Company, Fitchburg, Mass.
Crescent Stone Company, Evansville, Ind.
John Lucas & Co., Philadelphia, Pa.
American Steel & Wire Company, New York.
Supplee Hardware Company, Philadelphia, Pa.
Reading Hardware Company, Reading, Pa.
Liberty Stove Company, Philadelphia, Pa.
Alabastine Company, New York.
De Laval Separator Company, New York.
Du Pont de Nemours Powder Company, Wilmington, Del.
Price-Cline Harness & Tanning Company, Lenoir, N. C.
Harriman Mfg. Company, Harriman, Tenn.
Cordley & Hayes, New York.
William J. Oliver Mfg. Company, Knoxville, Tenn.
Leland Moore Paint & Oil Company, Charleston, S. C.
Carborundum Company, Niagara Falls, N. Y.
Pittsburgh Steel Company, Pittsburgh, Pa.
Majestic Mfg. Company, St. Louis, Mo.
Malleable Steel Range Mfg. Company, South Bend, Ind.
Virginia Hardware Mfg. Company, Danville, Va.
Rochester Stamping Company, Rochester, N. Y.
Benjamin A. Moore & Co., New York and Chicago.
Southern Co-operative Foundry Company, Rome, Ga.
Chattanooga Plow Company, Chattanooga, Tenn.
W. J. Loth Stove Company, Waynesboro, Va.
H. B. Davis Company, Baltimore, Md.

Resolutions.

In addition to the usual expressions of appreciation and thanks, the following resolutions were adopted:

We recommend a closer affiliation with the organizations of Hardware merchants in the various States, and we specially recommend that our delegate to the national convention be instructed to perfect an arrangement with the associations in the Southern States by which the meetings of these conventions can be held on rotating dates, so that the officers of the national convention and the representatives of the jobbers and manufacturers can attend the same in succession, thus adding largely to the success of these conventions and materially reducing the expenses of these officials and representatives.

We urge that every influence be brought to bear on our legislators to pass legislation favorable to the collection of accounts, and in this connection we favor passage of the law covering garnishment, so that recourse can be had on certain classes that make a practice of defrauding the retail merchant out of just obligations. We believe that the bankruptcy law as it now stands forms a cloak for dishonesty and that it is a breastwork behind which debtors can hide themselves and make action taken against them of no account. We believe that this law has outlived its usefulness and that it should be repealed.

We are convinced that the activity of our organization against parcel post should be maintained, and that we should not allow our past victories in this matter to mar eternal vigilance which will only be the price of triumph over these pernicious measures.

Convention Notes.

One of the most active of the associate members was M. C. Thompson, Southern manager of the H. B. Davis Company, Paint manufacturers of Baltimore, Md. At the opening session of the convention he responded on behalf of the associate members to the official address of welcome by the representative of the Mayor, making an appropriate and eloquent reply. He had also the distinction of having secured during the year the largest number of new members to the association, and at the closing session was presented with a fine shotgun in recognition of his services along this line.

The address of R. H. McDuffle on "The Only True Method That Produces Real Success" was an admirable presentation of the principles which should be followed in business, and gave a high ideal of the character and work of the really successful merchant.

The greetings of the New York Association were informally extended by R. R. Williams, Hardware editor

of *The Iron Age*, who was in attendance at the convention. The fraternal message thus carried was received with evident appreciation.

The Question Box.

An interesting session of the convention was held on Wednesday evening, when after the address of Railroad Commissioner J. M. Sullivan, Anderson, S. C., on "Railroad Legislation," the Question Box was taken up under the leadership of M. L. Corey. There was a good attendance of members, traveling salesmen and ladies. The questions which were formally proposed in the association handbook were the following:

Does it pay to sell goods at cost for advertising purposes?

Is it good business to mark goods in plain figures when you are doing a credit business?

What should be the attitude of the Hardware dealer toward the jobber who sells the general trade?

How can we increase the percentage of our cash trade and shorten the term of credit trade?

Is it desirable for the retail Hardware dealer to handle Agricultural Machinery?

Which is the more important, the buying or selling part of the business?

What per cent. of our sales should our stock be?

Is it good policy for the retail dealer to buy goods far ahead for future delivery?

Is it best to have strictly one price for every customer?

Do you carry insurance in Hardware Mutuals? If not, why not?

How can we better the condition of our association and increase its membership?

Comparatively few of these questions were reached, as the length of time consumed on two or three of them prevented the consideration of the others. A good deal of discussion was called out by the question

Does it pay to sell goods at cost for advertising purposes?

There was some diversity of opinion expressed on the question, but the general consensus seemed to be that in special cases it is good policy to sell certain goods at cost or approximate cost. This is certainly the case when it is desired to dispose of dead stock or articles which are otherwise unsalable. There was not entire agreement of opinion in regard to special or bargain sales, but there was a strong sentiment in favor of them as meeting the methods of competition and attracting the public to the store. It was, however, regarded a poor policy to make special sales on standard goods. Job lots of common and low priced articles are especially suitable for such occasions.

The Buying and the Selling Ends of the Business.

The question as to which is the more important—the buying or the selling—in the conduct of a retail store did not call out a great deal of discussion. It was recognized that both are of extreme importance. The opinion was expressed that the buying end is too much neglected in many Hardware stores, and the importance of close and careful purchasing of goods was emphasized.

Buying for Future Delivery.

There was a brief but animated discussion as to the advisability of retail merchants buying a considerable period in advance of their needs, especially on season goods. Some of the merchants were inclined to take the position that it is better to wait until a short time before the goods are required before placing orders, and the dangers of buying too far ahead were referred to. At this juncture H. W. Owsley of the Norvell-Shapleigh Hardware Company, St. Louis, was called upon for his opinion. This was given in a brief, clear-cut and convincing argument in favor of orders for future delivery as advantageous to the retailer, the jobber and the manufacturer. His position and the manner in which it was stated evidently met with the approval of most of the merchants, as his remarks were greeted with the heartiest applause of the evening.

While comparatively few questions were discussed, the suggestions brought out by the leader or by the merchants covered a wide range, and the time thus spent was stimulating and interesting. This was evidenced

by the fact that the session was continued until 10:30 with unabated interest.

Address of the President.

A Year of Difficulties Successfully Met—Legislation—Mutual Fire Insurance—State Mutual Proposed—Work of the Associate Members.

BY E. WALTER DUVALL, CHERAW, S. C.

When I was elected one year ago as the president of our association I fully realized the difficulties of this position at this particular time. I felt that we were passing through

a crisis, and that 1909 would probably decide its fate, whether it would die and go the way of so many organizations or whether it was to fill a place in the business world of the two Carolinas for which it is peculiarly fitted and for which it was organized.

I was quite sure that its days of usefulness were numbered, and that its disbandment was certain unless its officers and all of its members were ready to line up to its active support and be willing to give it a year of energy and work. When I saw a list of the other officers I was sure that as far as lay in their power they

would leave nothing undone to make it a successful year, and I had full confidence in the members, and that confidence has not been misplaced.

It Has Been a Strenuous Year

and there has been much work done, and I have not called on a single man who has not willingly responded and done heartily what was asked of him, and there has been the heartiest co-operation between the officers, and we come here to-day proud of the report of accomplishments which you will hear from the several committees.

Work of the Legislative Committees.

Our Legislative Committees have not been idle. The North Carolina Committee went actively to work when an adverse pistol bill was introduced in the Legislature, and it was finally killed. In South Carolina we have put our whole energy on getting through a bill improving our lien law. We have one now which has passed the Senate, and is up to second reading in the House, which I consider a wonderful improvement on what we have been working under, and the only thing that kept it from becoming a law last year was that every thing else in our Legislature was sidetracked for the liquor fight, and when that was finished there was only time for the actually necessary bills before adjournment time. This bill will require the influence of each of the members of the association, and when they are notified by the secretary that the fight is on I urge them to bring all the force they have to bear on the members from their respective counties.

Economy of Mutual Insurance.

Now, I come to what looks to me like the most important item of our work when we consider the actual dollars and cents in our pockets, and which it seems we are utterly failing to take advantage of—namely, mutual insurance. There is the National Mutual Insurance Company, which is backed by the National Association, and there are several of the State associations which are ready to do business in our States, and I will state right here that as far as the financial responsibility of these companies goes some of our members have had it thoroughly investigated, and we find them to be all that any one could ask. In fact, they have more funds on hand to each dollar of insurance carried than any of the old line companies that we could find. As to their willingness to pay all just losses we have been unable to find a single instance where they have given the insured the slightest trouble in getting a satisfactory settlement.

The insurance laws of both North and South Carolina seem to be written very much in the interest of the large old line companies, and a company, no matter how good,

that wishes to do a limited business in our Carolina Laws States is practically disbarred from competing with the regulations. As you all know a State cannot make it unlawful for you to make a contract with any citizen or company of



E. WALTER DUVALL.

another State, but to get around this the law forbids the agent of these companies from soliciting business in our States and refuses the use of her courts to her own citizens in collecting a claim against a company that has not complied with the insurance laws. The law also forbids these companies from sending an adjuster into our States to adjust a claim.

Now, as to the first of these objections, all that you have to do is to write for an application and fill it in and mail it to the secretary of the company to get your policy. To the second objection, should the company wish **Overcoming Objections** to fight the claim you have the United States Courts open to you at all times, and even if the

State courts were open to you if the amount sued for was beyond a certain amount the party from the other State can have the suit transferred, so this objection fades into insignificance. To meet the third point, these companies require you to carry at least one policy with an old line company, and they settle with you on exactly the same basis as is agreed on your other policy.

Now, I want to try to give you just some idea what this insurance means to us in dollars. There is carried in mutuals by our members to-day about \$100,000. The premiums on this amount to about \$1500, of which they are returning to us about 50 per cent, or \$750. We have 150 members who carry an average of not less than

Dollars \$8000, making a total of \$1,200,000. Putting **and Cents** this at \$15, which I suppose is a fair average, we are paying premiums of something like \$18 per year, and half of that back to us would be a clear saving of \$9000 every year. Now, members, is not that worth giving serious consideration? Some may think that these companies cannot safely furnish us insurance at this price, but when I tell you that in the five years they have been doing business with us they have had but one loss, you can see they are not losing any money on us.

With a view to removing the last objection to this insurance and satisfying those who object to doing any business contrary to the ways set down by the State Legislature, I have had several conferences with our State Commissioner and only a few days ago he outlined to me what he would be willing to do in the matter. He says if we will organize a State mutual under the association that he **License from State** will license us and we can do a fire insurance business with all the privileges of any company.

We need not have any capital stock at all, which means that we will not have to put any money in the undertaking and he will take the bond of the officers of the company for the \$20,000 which the law requires as a deposit. Then we can reinsure every dollar of our business to the companies that will give us the best terms. Of course, this would mean considerable work either by the secretary or some one else, but it would put us in a position to get the very best terms from the company to whom we gave the business and it would be the means also, I believe, in mak-

ing the members feel better satisfied about taking it. I therefore recommend that the incoming president appoint a committee of three from each State to see what can be done along these lines and that these committees have authority to act if in their opinion it is advisable.

Activity of Associate Members.

I call special attention to the splendid work done for the association by the associate members during the past year. They have done more toward securing new members and keeping up the interest among the old ones than any other one source. As you all no doubt know, the associate members have no voice in the management of the affairs of the association, and yet their dues are the same as the active members, and I recommend that their dues hereafter be \$3 instead of \$5, as heretofore. I believe this will encourage many more of them to join the association and work with us.

Report of the Secretary.

A Review of the Work and Accomplishments of the Association.

BY T. W. DIXON, CHARLOTTE, N. C.

In making this my first annual report as secretary of your association I think I may be allowed to ask that you keep in mind some of the obstacles we have had to encounter and some of the difficulties with which we have had to contend. As a general rule, the measure of one's success is the measure of one's effort; at the same time adverse circumstances have their weight and are not to be altogether ignored. Judged by this standard results will show that we have not been idle, though they may not be altogether satisfactory nor measure up to your expectations.

Parcel Post.

Working with and under the direction of our able and enthusiastic national secretary we have given some time to matters affecting not alone our own members, but the members of all the other organizations comprising the National Retail Hard-



T. W. DIXON.

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ware Association, of which we are a component part. This work has had special reference to the parcel post measure, the adoption of which has been prevented by the combined and united efforts of mercantile organizations throughout the country, among whom the National Association has taken an active and very prominent part. This measure has been defeated for the time being, but it is by no means dead, and will continue to be a menace to all retail interests until its agitation by politicians is effectually silenced by the eternal vigilance of its opponents.

Ammunition Shipments.

Another matter of general interest that has had our attention was an order of the railroad commission which would allow the shipping of only a limited amount of metallic ammunition with other merchandise based on its being explosive and therefore dangerous. With this rule in effect, the sale of Ammunition would have been confined to a very few dealers or made so unprofitable as to be practically prohibitive. By prompt protest this was withdrawn, and the shipping regulations allowed to remain as they had been before.

Manufacturers and Catalogue Houses.

A reference to catalogue houses is likely to make you think of chestnuts, but I think it is due our friends to say that we have assurances from all the leading Ammunition and Saw manufacturers that it is their uniform policy to leave them severely alone and distribute their product through the recognized legitimate channels of trade.

Freight Discrimination.

There are other matters of national import, in which we were interested, such as the tariff freight rates and such like, but owing to their magnitude your secretary did not feel equal to an undertaking so far beyond his depth. If, however, it is in my province to do so I would like to suggest that a Transportation Committee be appointed from our association to act with like committees from other organizations, with a view to correcting freight discriminations which have for years and will continue to handicap the merchants of the Carolinas until they are corrected.

Lien Law.

As to matters affecting directly the interests and welfare of our own members with special reference to South Carolina: At the solicitation of many members and at the instigation of the lumber and supply dealers of the State, we made a thorough canvass of the Hardware dealers as to their views on the present lien law, and the necessity, if any, for its amendment. We were more than fortunate this year along this line in having as a representative in the Legislature one of our most active and loyal members, E. W. Duvall of Cheraw, S. C., and I am pleased to refer to him those interested in this matter and he will doubtless be glad to explain the situation and give the present status of the case. There seems to be some difference of opinion among the members as to the need of any change in the law as it now is, some claiming that without amendment it gives ample protection.

Bill Affecting Sale of Pistols Killed.

My special letters to our North Carolina members have been largely confined to one subject, the sale of Revolvers and Ammunition, and they have not been voluminous for the reason that our wideawake vice-president, R. H. McDuffie of Fayetteville, got wise to the situation, took the bull by the horns, so to speak, made a trip to Raleigh and promptly and effectually killed the bill referred to in committee. In connection with this matter and as evidence that the work of the Hardware association is effective and that we are a power to be reckoned with, I have in my possession a letter to Mr. McDuffie from a large manufacturer speaking in very complimentary terms to this effect.

Suggestions Wanted.

Right here I want to ask members to make suggestions occasionally as to how we can be of service and along what lines our energies should be directed. Not that we hesitate to take the initiative, but many things escape us, are overlooked, and do not appeal to us as being important, when in reality they may be vitally so. The very purpose of our organization is to get the ideas of all, select the best and by combined effort, working as a unit, accomplish with a few hundreds what thousands could not do working individually and independently.

Incorporation.

As per resolution passed at the Wrightsville convention we have had the association incorporated in South Carolina, with headquarters at Rock Hill, and domesticated in North Carolina with office at Charlotte. By reason of the liberal corporation laws of South Carolina, this was done at a cost of \$14.05, the seal costing \$2.50 additional.

Increased Membership.

I must extend my hearty and sincere thanks to all the active and associate members who have so kindly helped me in my canvass for new members. I beg to take a little of the

credit for the increase, but candor compels me to say that our growth is largely due to the solicitation of members. I am pleased to report the addition of many names since the last meeting, both active and associate, and we have every assurance that the number will be materially increased during the convention. These additions have been secured by a comparatively few members, which shows what could be done if we would all put our shoulders to the wheel. You may say this is my business, and so it is, but the funds are lacking for a personal canvass without the insurance feature, and besides it is my candid opinion that your solicitation will be much more effective at much less cost than a personal canvass of mine or any other secretary.

Real Business Success.

The Only True Method of Achieving It.

AN ADDRESS BY R. H. McDUFFIE, FAYETTEVILLE, N. C.

Success does not mean simply carrying our point, making money and accumulating fortunes, but it has a broader meaning. A man who accumulates a fortune by shady methods has not made a success, but the man who accumulates something by honest methods, has a clear conscience and is happy and contented, is the man, in my opinion, that has attained real success. However, as my subject indicates that there is only one method, I shall contend that there is but one safe method. Now, I have selected as my text, "Honesty the Best Policy, or the Square Deal." I believe the square deal is the only method that will produce genuine success, and when the square deal is combined with well developed ability placed in full action, success is bound to follow.

R. H. McDUFFIE.

The Principle of the Square Deal
is not only to be honest and reliable in a general sense, but to be so in the absolute sense; that is, to aim to give an exact equivalent in every transaction and to give the highest possible worth to everything we produce and offer for sale. To simply be honest in the ordinary sense of the term is not enough; we must be so honest that we will not give anything to the world but the very best we can produce. The man who places an inferior product upon the market when he has the ability to produce a superior product is not strictly honest; he is not giving his best to the world. We are not giving the world a square deal unless we offer our very best.

The man who is reckless or slovenly in his work is not an honest workman, even though he may be poorly paid just now. To be strictly honest and thoroughly just to himself he must do his work so well that he could not possibly improve up it.

Absolute Honesty.

There are many people who believe that absolute honesty is not necessary to success, and there are a few even who believe that reliability is an obstacle if great success is to be attained, but it will not require much clear thought to understand that the opposite is the truth. The real business of the world is based upon the principle of an exact equivalent, returning worth for worth, and so necessary is this principle to the very existence of the business world that no enterprise whatever could exist if this principle were removed.

Parasites.

The man who accumulates a fortune through "shady" methods does not engage in real business; he simply acts as a parasite upon the reliable business enterprises of other men. He would therefore starve if honest men should cease to conduct business. The parasite always dies when you remove the source of his life and power.

Take away legitimate business and illegitimate business would go into bankruptcy at once; take away illegitimate business and the legitimate would thrive as never before. Destroy the animal that supports the parasite and the parasite will also die, but remove only the parasite and it is clear that the animal will become stronger, healthier, more vigorous and more powerful than ever before.

The honest business of the world not only supports itself, but it also supports the dishonest; it not only supplies vitality for its own continued existence, but it gives away a great deal of extra vitality to keep alive the parasites. If

it should cease to give away that extra vitality and use all its life in promoting its own legitimate ends, it is evident that real, legitimate business would overflow with wealth in every part of the world.

A Winning Combination.

The square deal, combined with well developed ability, will win every time, and its gains will be far greater when it refuses to give part of its life to keep parasites in thriving existence. The man who thinks there is no success in reliability tries to supplant his own lack of ability with unreliability. Being unable to create his own success he appropriates a considerable portion of the success that has been created by others. He calls his own power of appropriation and accumulation success, but he forgets that if others did not create success there would be no success for him to appropriate, and he also forgets the fact that only the man who creates success is entitled to success.

When the Majority Realize

that it is only ability that can create success, and that ability produces the greatest results when acting through reliability, the parasite will disappear from the business world, and the number realizing this great fact is growing very rapidly.

In my opinion the quickest way to eliminate this parasite and thereby remove the greatest block in the way to greatest success is to take advantage of the great opportunity we have to labor honestly and deal fairly with our fellowman, always keeping before us as our motto, "A square deal to all."

To the 85,000,000 of people that make up this great Republic the opportunity to labor honestly means more than to all the world besides. It means the development of resources great beyond the comprehension of any mortal, and the diffusion among all of riches to which the glories of "The Arabian Nights" are but the glitter of the pawnshop, and to which the sheen of all the jewels of this earth are but the gleam of the glow worm in the pallor of the dawn.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers catalogues, price-lists, quotations, &c.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM RICHLAND HARDWARE COMPANY, which has succeeded L. C. Michener in business in Richland, Wash., handling Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Window Glass, Agricultural Implements, Paints, Sporting Goods, Crockery and Harness. The store arrangement has been changed and additional warehouse space provided.

FROM COLTON HARDWARE COMPANY, which is having a new building erected in Colton, Cal. The building is 60 x 113 ft., three stories and basement. The company handles wholesale and retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Window Glass, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Furniture, Pianos, Harness, Wagons, Buggies, Fuel Oils, Electric and Plumbers' Supplies; also Cornice and Galvanized Iron Work.

FROM RAKER HARDWARE COMPANY, recently organized in Scranton, Pa., handling at wholesale exclusively, Hardware, Cutlery, Tin, Galvanized and Enamelled Ware, Woodenware, House Furnishing Goods, Paints, Stoves and Mine Supplies.

The R. C. Ware Hardware Company, Plainview, Texas, has been incorporated with a capital stock of \$40,000. The company will carry a line of general Hardware, Vehicles, Agricultural Implements, Stoves and Ranges. The incorporators are R. C. Ware, C. M. Donohoo, R. W. Braham and Lee Shropshire.

The Frank Colladay Hardware Company, Hutchinson, Kan., has increased its capital stock from \$15,000 to \$25,000. The company is erecting a new building, 26 x 127 ft., three stories high. It handles Shelf and Heavy Hardware, Stoves, House Furnishings, Saddlery and Horse Goods and Sporting Goods.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for our Catalogue Department and for notice in this column.

KIRK-LATTY MFG. COMPANY, Cleveland, Ohio: Catalogue 1909-1910 illustrating Juvenile Automobiles, Twentieth Century and Hercules, all Steel Express Wagons, Velocipedes, Toy Garden Barrows, Cycle Wagons, Hand Cars, Sulkies, &c.

CORBIN SCREW CORPORATION, New Britain, Conn.: Catalogue of 56 pages devoted to Bolts, Cap Screws, Jack and Safety Chain, Coach Screws, Coaster and Motor Cycle Brakes, Collar Screws, Dog Leads, Escutcheon Pins, Hand Rail Screws, Hinge Pins, Machine Screws, Brads, Miscellaneous Nails, Carpet Tacks, Nuts, Sash Pins, Saw Screws, Set Screws, Side Knob Screws, Stove Door Pins, Stove Rods, Milled Iron Studs, Taper Pins, Taps, Thumb Screws and Washers. The company calls attention to its facilities for automatic screw machine work, and is prepared to make estimates on special goods.

WAGNER MFG. COMPANY, Cedar Falls, Iowa: Catalogue No. 8, illustrating Auto Coaster Wagon and Bumble Bee Coasters, for both of which detachable runners are obtainable.

W. W. BABCOCK COMPANY, Bath, N. Y.: Illustrated booklet showing Extension Ladders, Single Ladders, Trestles, Step Ladders, Lawn Swings and Jackson Barrel and Dash Churns.

POTATO IMPLEMENT COMPANY, Traverse City, Mich.: Catalogue relating to Hand Potato Planters and Diggers, Corn Planters, Sprayers, Powder Guns, Plaster Sifters, Knapsack Sprinklers and Compressed Air Sprayers.

GRIP NUT COMPANY, Chicago, Eastern office, New York City: Catalogue No. 17 just issued describing a line of Universal Window Fixtures, Sash Locks, Sash Balances, Weather Stripping, Deck Sash Ratchet, Steel Sash and Special Car Trimmings. The various designs of these goods are handsomely illustrated with colored plates and in broken away sections showing the method of construction and application. These fixtures are designed for either wood or steel window sash, and windows fitted with them are said to be automatically sealed, airtight and dustproof.

WHITNEY MFG. COMPANY, Rockford, Ill.: Two folders, one entitled "Jobbers' Opinions," containing expressions from large houses handling the Whitney Portable Hand Metal Punch, and the other giving testimonials from actual users of the Punch.

Wood & Co., Newburgh, N. Y., have purchased the brick block, known as the Chapman Block, for a permanent location. They will incorporate with \$40,000 capital, under the name of the Wood Hardware Company. Frank B. Peck of the Frank B. Peck Company, Hornell, N. Y., and Guy S. Wood, who traveled for some years for the Supplee Hardware Company, Philadelphia. The members of the firm, are experienced, energetic and progressive business men, and their aim will be to make the store and its service up to date in every respect.

BUTLER BROTHERS, Chicago, Ill., will open a new sample house in Cincinnati, Ohio, early in August. Their new Kansas City sample house will be opened about the same time. The Cincinnati establishment will be located at Third and Race streets, a building of five floors and basement with about 22,000 sq. ft. of floor space. Here a complete line of samples of the immense stock of merchandise carried by the house will be displayed, all orders being filled from Chicago. George W. Albright, who has had charge of the Omaha sample house, will be the Cincinnati manager, Mr. Albright being succeeded in Omaha by John Hauck, who has been assistant manager in that city for some time.

R. B. Teague & Co. have established themselves in business in Ridgefarm, Ill., handling Shelf Hardware, Stoves, Tinware, Window Glass and Sporting Goods.

The Hawkeye Wrench.

The Hawkeye Wrench Company, Marshalltown, Iowa, manufacturer of the Hawkeye wrench, has made several improvements in the wrench. These include a change in shape and the adoption of a high grade of tool steel in its construction. The wrench is also given a different finish from that originally used.

White Family Size Mop Wringer.

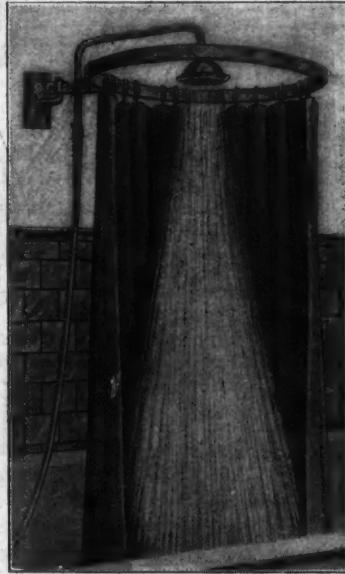
The White Mop Wringer Company, Fultonville, N. Y., has put on the market a new mop wringer in family size containing all the features of the company's line. It is all metal, light in weight, compact and leaves an abundance of room in pail for rinsing the mop. The company points out that as the wringer is not made of sheet metal it will not easily rust out, and that it will stand severe usage and retain its shape and usefulness.

Doll Go-Carts, Sleepers and Carriages.

The Heywood Brothers & Wakefield Company, Gardner, Mass., has put on the market a line of doll go-carts, sleepers and carriages comprising several patterns. All have tops, some of which fold and others are with curtains to roll up. The bodies are finished in different ways, some covered with leather cloth and others painted and striped. The entire line is supplied with rubber tire wheels.

The Zephyr Shower.

The shower shown herewith is manufactured by the Zephyr Ventilator & Mfg. Company, Philadelphia, Pa. The water is received from the regular bath cock, with which it is connected by a rubber tube. The shower is attached to the wall above the bath tub in the simple manner shown. At the point of support the ends of the



The Zephyr Shower Connected with Regular Bath Cock by Rubber Tube.

ring are bent to fit together as a clamp, fixed around the wall hook and also clamping the pipe carrying the spray head. This arrangement permits the spray head to be adjusted with respect to height, raising or lowering it through the clamp to suit conditions. The company makes the point that as there is no fitting necessary in installing the spray requiring the services of a plumber, the device is particularly suitable to be handled by the Hardware trade.

Olson, Johnson & Nelson have purchased the general merchandise stock of Oscar Larson, Troy, Idaho.

Artistic Brass Candlesticks.

The Bradley & Hubbard Mfg. Company, Meriden, Conn., and 26 Park place, New York, has just supplemented a line of about 50 styles of brass candlesticks and candelabra, in old brass and polished brass and bronze finishes, by the addition of six other styles, three of which are shown. Style 8109, Fig. 1, is in old brass, with $5\frac{1}{2}$ -in. base, plain glass chimney and plain brass socket for candle. No. 7286, Fig. 2, is 12 in. high over all, old brass finish, glass chimney, ground both at top and bottom, and equipped with receptacle for holding a box of safety matches, ne-

cessitating the use of its special scratching surface. It also has the improved spring candle holder, which keeps the candle in position until entirely consumed. No. 8153, Fig. 3, is 14 in. high, base $5\frac{1}{2}$ in. in diameter, partly ground chimney and improved spring candle holder. The other styles include No. 7285, 14 in. high, 5 in. base, body $1\frac{1}{4}$ in., square and right angle handle instead of curved top and bottom. No. 7284 is similar in detail except it is 18 in. over all in height. The advantage of the artistic candlesticks is the protection of flame from wind, as well as diminution of fire hazard to clothing or building from contact with lace curtains or other highly inflammable materials, all of them having detachable brass caps on top of chimney. At somewhat higher cost there are two styles of two-light candelabra, with both



Fig. 1.—Brass Candlestick, No. 8109, with Plain Glass Chimney.



Fig. 2.—Brass Candlestick No. 7286, Chimney Ground Top and Bottom, Match Box Holder and Spring Candle Holder.

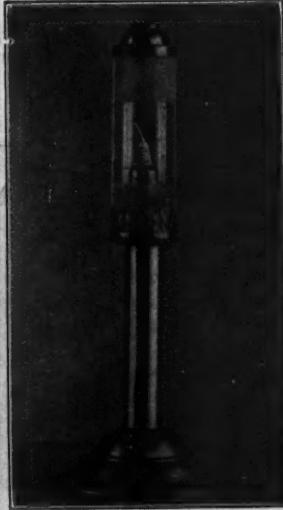


Fig. 3.—Style No. 8153, with Spring Candle Holder and Ground Chimney.

spring holders and part ground chimneys, both in the No. 8154, fitted with art glass shades, and in No. 7299, similar with hand painted glass shades. Closely allied with these goods is a large assortment of brass jardinières in various finishes, most of them new designs.

E. P. STOUGHTON, vice-president of the Millers Falls Company, sailed July 8, accompanied by his daughter, for one of his customary European trips, mainly for recreation. They will visit parts of Italy, Switzerland, Germany, Holland, England and Scotland, expecting to be back in New York about September 21.

Winslow Women's Lever Clamp Skate No. 49.

The Samuel Winslow Skate Mfg. Company, Worcester, Mass., is offering a skate for women which is attached to the shoe by means of full heel strap and

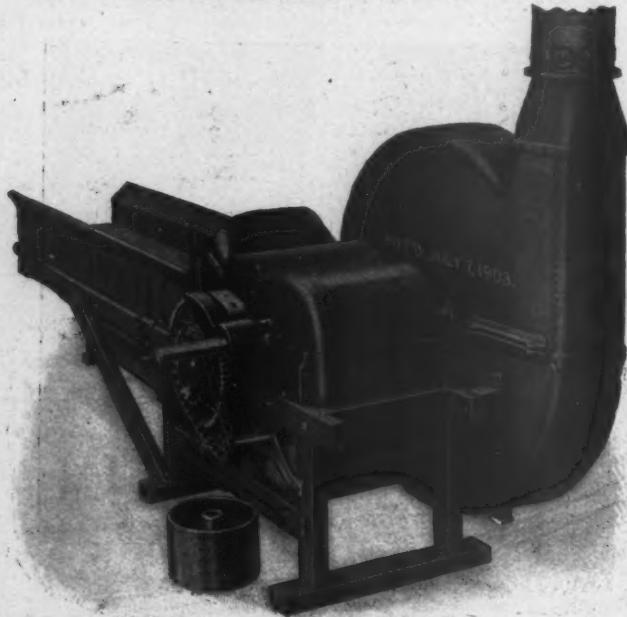


Winslow Women's Lever Clamp Skate No. 49.

lever to clamp the sole. The runner is curved, as shown in the illustration; plain beveled, and not chamfered or polished, the entire skate being nickel plated.

The Ohio Monarch Self-Feed Ensilage Cutters.

The accompanying illustration represents one size of a group of five ensilage cutters and blowers manufactured by the Silver Mfg. Company, Salem, Ohio. The company has made recent changes in its line of cutters, making for greater simplicity and for easier and stronger feeding, these features being embodied in the cutter shown. The five sizes are the same in construction and design, but differ in capacity, and are fitted with traveling feed table and blower elevator. The feature of the direct blast blower is that it will admit of continuous feeding. The cutting cylinder is covered with a hood, which can be lifted, affording easy access to the cutting mechanism. A characteristic of the cutters, the company states, is the ability to produce with so little power. The power is applied primarily to the main shaft and all the heavy work—cutting and elevating—is done direct from the



The Ohio Monarch Self-Feed Ensilage Cutter with Blower Elevator.

shaft, avoiding the use of short belts, transmission gears, &c., and the consequent waste of power. The knife shaft is steel, $1\frac{1}{8}$ inch in diameter. The knife heads are solid and heavy, the cylinder large in diameter, and there are set screws back of each of the four knives for accurately adjusting them. Each knife has four strong bolts, and the cutting edges of the knives are carefully tempered high carbon steel. One end of the knife shaft fits the driving pulley, on the other end the blower fan wheel. The traveling feed table is the full width of the machine and long enough readily to take a bundle of corn. Stop-feed, throw-out levers are provided for both the feed roll gears and the traveling table. The combined fluted and spiked upper feed roller raises or lowers auto-

matically, according to quantity being fed. The lower roller is rough, being composed of sectional disks. The fan wheel, with four steel blades, is heavy and solid, so that it serves also as a flywheel. The cut material is conveyed to the blower by an auger-shaped device. It is placed immediately beneath the knives and is operated by sprocket chain from main gear. The blower pipe is galvanized steel with standing seam on the outside, running lengthwise, made in convenient lengths, with 12-inch slip joints and a clamping band at each joint. A distributor, which is to connect the upper end of pipe and convey the cut ensilage into the silo and distribute it, is included with each machine. Under ordinary conditions, it is explained, either size will cut and elevate green corn at the rate of one ton or more of ensilage for each horsepower applied. By substituting shredder blades for the cutting knives, shredding can be accomplished.

Cordeaux French Pump.

The Gleason-Peters Air Pump Company, 255-261 Classon avenue, Brooklyn, N. Y., in addition to a large-assortment of air compressors, pumps, appliances and fittings, is manufacturing the Cordeaux French pump, No. 273, here shown as in use and in compact form for carrying. The cylinder is $1\frac{1}{4}$ x 20 in. and is capable of a possible pressure of 125 lb. to the square inch. The cylinder is of special heavy gauge seamless brass tubing; cap and base are heavy bronze metal castings, the cap having a heavy collar guide to prevent lateral strain.

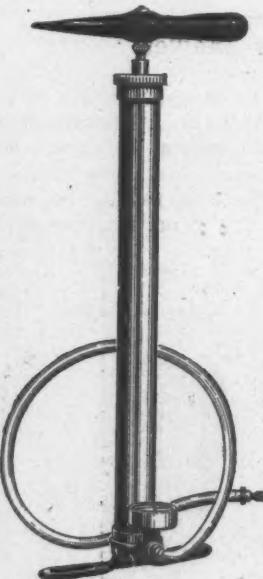


Fig. 1.—Cordeaux French Pump with Gauge as in Use.



Fig. 2.—Handle Detached and Stirrups Parallel to Cylinder for Compactness.

and insures an even action on the plunger rod. The malleable iron stirrups are of the ratchet pattern, double-acting, and, by pressing either one, fold close to cylinder. The detachable hard white maple handle, with long threaded inside nut for attaching to plunger rod, is wedge shaped on one end for use in removing rubber tires on automobiles. The pump is equipped with a $1\frac{1}{2}$ -in. back connection gauge having a red indicator at 90 lb., a Gleason improved positive check valve, a Gleason improved cup leather and 3 ft. best grade of high-pressure 3-16-in. red rubber tubing and connection.

Gray Suede Leather Pistol Holsters.

E. A. Cauter, 147 West Broadway, New York, manufacturing fine leather goods for hardware, cutlery, firearms, &c., has just put on the market two styles of pistol and revolver cases having new and distinctive features. Fig. 1 illustrates a case for Colt's new automatic 0.25-caliber pistol, one of which is partly exposed. The case, Fig. 2, is designed for revolvers, both styles being ob-

tainable for larger calibers as well. All are made of fine gray suede leather and lined with high grade green

snap catch. The case shown in Fig. 2 is finished with a 7-31-in. silk cushion binding and snap metal button, har-



Fig. 1.—Gray Suede Leather Pocket Pistol Case, Lined with Green Piano Felt, Having Snap Catch.

piano felt. For the Colts' automatic the opening is guarded with polished and nickeled metal frame and



Fig. 2.—Revolver Case of Same Materials with Bound Leather Strap, Opposite, for Waist Belt.

monizing with the color of the leather. The revolver case has on the reverse side a leather strap similarly bound on four sides through which to pass a waist belt when not carried in the pocket. The strong points of the holsters are snug fit, all round handsome appearance and serviceability for protecting fine firearms from grit and moisture when carried close to the body.

PAINTS, OILS AND COLORS

Animals, Fish and Vegetable Oils— $\frac{1}{2}$ gal.

Linseed, Western, Raw	60 @ \$1
State, Raw	60 @ \$1
City, Raw	61 @ \$2
Boiled, 1 $\frac{1}{2}$ $\frac{1}{2}$ gal. advance on Raw.	61 @ \$2
Raw, Calcutta, in bbls.	75 @ \$1
Lard, Prime Winter	90 @ \$1
Extra No. 1	57 @ \$1
No. 1	45 @ \$1
Cotton-seed, Crude, f.o.b. mill	4.67 @ \$1.73
Summer, Yellow, prime	5.69 @ \$1.73
Summer, White	6.00 @ \$1.10
Yellow, Winter	6.15 @ \$1.20
Tallow, Acidless	57 @ \$1
Menhaden, Brown, Strained	33 @ \$1
Northern, Crude	24 @ \$1
Southern	23 @ \$1
Light Strained	33 @ \$1
Bleached Winter	36 @ \$1
Extra Bleached Winter	38 @ \$1
Cocoanut, Ceylon	7.25 @ \$1.35
Cochin	7.10 @ \$1.35
Cod, Domestic, Prime	38 @ \$1
Newfoundland	40 @ \$1
Red Elaine	43 @ \$1
Saponified	70 lb 5% @ \$6
Olive, Yellow	1.30 @ \$1
Neatsfoot, Prime	55 @ \$6
Palm, Lagos	70 lb 5% @ \$1

Mineral Oils— $\frac{1}{2}$ gal.

Black, 29 gravity, 25@30 cold test	12 $\frac{1}{2}$ @ \$13
29 gravity, 15 cold test	13 @ \$13 $\frac{1}{2}$
Summer	12 @ \$12 $\frac{1}{2}$
Cylinder, light filtered	20 @ \$20
Dark, filtered	17 $\frac{1}{2}$ @ \$18
Paraffine, 903-907 sp. gravity	11 @ \$14 $\frac{1}{2}$
903 sp. gravity	13 @ \$13 $\frac{1}{2}$
883 sp. gravity	10 $\frac{1}{2}$ @ \$11
Red	13 @ \$13 $\frac{1}{2}$

Miscellaneous— $\frac{1}{2}$ gal.

Barites:	
White, Foreign	10 ton \$18.50 @ \$20.50
Amer. floated	10 ton 17.00 @ \$18.00
Off color	10 ton 12.50 @ \$15.00
Chalk in bulk	3.00 @ \$1.40

China Clay, Imported— $\frac{1}{2}$ gal.

Cobalt, Oxide	100 lb 1.45 @ \$2.60
Whiting, Commercial	100 lb 1.45 @ \$2.50
Gilders	100 lb .52 @ .64
Ex. Gilders	100 lb .56 @ .68

Putty, Commercial— $\frac{1}{2}$ gal.

In bladders	1.70 @ \$2.00
In bbls. or tubs, 100 lb.	1.20 @ \$1.45
In 1 lb. to 5 lb. tins	2.65 @ \$2.25
In 12 $\frac{1}{2}$ to 50 lb. tins	1.50 @ \$1.90

Spirits Turpentine— $\frac{1}{2}$ gal.

In Oil bbls.	49 @ \$49
In Machine bbls.	49 @ \$30

Glue— $\frac{1}{2}$ lb.

Cabinet	12 @ \$16
Common Bone	17 @ \$9
Extra White	18 @ \$21
Fish, liquid, 50 gal. bbls., per gal.	100 @ \$1.20
Foot Stock, White	12 @ \$14
Foot Stock, Brown	7 @ \$11
German Common Hide	10 @ \$12
German Hide	12 @ \$16
French	10 @ \$14
Irish	13 @ \$16
Low Grade	10 @ \$12
Medium White	14 @ \$19

Gum Shellac— $\frac{1}{2}$ lb.

Bleached, Commercial	16 @ \$14
Bone Dry	20 @ \$20
Button	20 @ \$30
Diamond I.	25 @ \$25
Fine Orange	20 @ \$21
A. C. Garnet	15 $\frac{1}{2}$ @ \$16
Light Orange	17 @ \$19
Kala Button	10 @ \$11
D. C.	25 @ \$25
Cetagon B.	22 @ \$23
T. N.	14 @ \$15
V. S. O.	23 @ \$21

Colors in Oil— $\frac{1}{2}$ lb.

Black, Lampblack	12 @ \$14
Blue, Chinese	16 @ \$16
Blue, Prussian	32 @ \$36

White and Red, Lead &c.— $\frac{1}{2}$ lb.

Lead, English white, in Oil—10% @ 10%	
Lead, American White:	
Dry and in Oil, 100, 200 and 500 lb. kgs.	5% @ 5
Dry and in Oil, 25 and 50 lb. kgs.	5% @ 5
Dry and in Oil, 12 $\frac{1}{2}$ lb. tin pails.	5% @ 5
In Oil, 1, 2, 3 and 5 lb. tin cans, ass't.	5% @ 5
Red Lead and Litharge:	
In 100 lb. kgs.	7
In 25 and 50 lb. kgs.	7
In 12 $\frac{1}{2}$ lb. kgs.	7
In lots of less than 500 lbs. 1 $\frac{1}{2}$ lb. advance over above prices of White and Red Lead and Litharge.	5% @ 5
Lead, American, Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry— $\frac{1}{2}$ lb.

American, dry	54 @ \$5
Red Seal (French process)	6% @ 7
Green Seal	7% @ 7
German Red Seal (French process)	7% @ 7
Kala Button	7 @ \$11
D. C.	25 @ \$25
Cetagon B.	22 @ \$23
T. N.	14 @ \$15
V. S. O.	23 @ \$21

Dry Colors— $\frac{1}{2}$ lb.

Black, Carbon	7 @ \$10
Black Drop, American	3 $\frac{1}{2}$ @ \$8

Metallic Paint, $\frac{1}{2}$ ton

Black, Drop, English	5 @ \$15
Black, Ivory	16 @ \$16
Lamp, commercial	3 @ \$5
Blue, Celestial	4 @ \$6
Sienna, Raw	12 @ \$15
Sienna, Burnt	12 @ \$15
Umbre, Raw	11 @ \$14
Umbre, Burnt	11 @ \$14
Drop, English	5 @ \$15
Red, Ivory	14.50 @ \$22.00
Red	14.00 @ \$18.00
Ocher, American	7 @ \$18.00 @ \$15.00
American Golden	4 @ \$5
French	14 @ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @ 12
French	12 @ 13
German	12 @ 13
American	12 @ 13
Red, Indian, English	5 @ 7
American	3 @ \$14
Red, Turkey, English	4 @ \$10
Red, Tuscan, English	7 @ \$10
Red, Venetian, Amer.	7 @ \$10.75 @ \$1.50
English	7 @ \$10.75 @ \$1.50
Sienna, Italian, Burnt and Powdered	3 @ 3
Italian, Raw, Powdered	2 @ 3
American, Raw	24 @ 3
American Burnt and Pow'd	24 @ 3
Talc, French	7 ton \$18.00 @ \$25.00
American	7 ton 15.00 @ \$25.00
Terra Alba, French	7 ton 100 lb. \$10.00 @ \$1.00
English	7 ton 100 lb. \$10.00 @ \$1.00
American	7 ton 100 lb. No. 2, \$6.00 @ \$6
Umbre, T'key, Bnt, & Pow	24 @ 3
Turkey, Raw and Powdered	2 @ 2
Burnt, American	2 @ 2
Raw, American	2 @ 2
Yellow Chrome, Pure	12 @ \$15
Oxide Red, American	2 @ 14
Vermilion, English, Imported	670
Chinese	30.90 @ \$3.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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Current Hardware Prices.

General Goods.—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus $33\frac{1}{2} @ 33\frac{1}{2} & 10\%$ signifies that the price of the goods in question ranges from $33\frac{1}{2}$ per cent. discount to $33\frac{1}{2}$ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also **THE IRON AGE DIRECTORY**, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—“The Iron Age Standard Hardware Lists,” 218 pages, price \$2, prepaid, contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—	33½%
Columbian and Domestic.....	10%
North's.....	10%
Upson's Patent, $\frac{3}{4}$ gro. \$29.00.....	10%
Zimmerman's—See Fasteners, Blind.	
Window Stop—	
Ives' Patent.....	10%
Ives' Stop, Bead Screws and Washers.....	10%
Taplin's Perfection.....	10%
Ammunition—See Caps, Cartridges, Shells, &c.	
Anti-Rattlers—	
Fernal Mfg. Co. Burton Anti-Rattlers, $\frac{1}{2}$ doz. pairs, Nos. 1, 20½; 2, 30; 4, \$1.00; 5, \$0.50.	
Quick Shifter, $\frac{1}{2}$ doz. pairs.....	2.00@33.00
Anvils—American—	
Eagle Anvils.....	99¢
Hu-Budden, Wrought.....	9½@9½
Trenton.....	9½@9½
Imported—	
Svedish Solid Steel Paragon, $\frac{3}{4}$ lb. 10@10½%	
Svedish Solid Steel Sisco, Superior, 2½ lb. 10@10½%	
Pete Wright & Sons, $\frac{3}{4}$ lb. 81 to 310 lb. 11½@35 to 600 lb. 11½¢.	
Anvils, Vice and Drill—	
Milders' Vails Co., \$16.00.....	15&10%
Apple Parers—See Parers, Apple, &c.	
Aprons, Blacksmiths'—	
Livingston Nail Co.....	10%
Augers and Bits—	
Com. Double Spur.....	80%
Jennings' Patn., Bright 65¢@10½@70%	
Black Lip or Blued.....	65@65½
Boring Mach. Augers.....	70%
Car Bits, 12-in. twist.....	40@10½
Ford's Auger and Car Bits.....	40@5½
St. Washington Auger Co., Com. ard's.....	35%
Forster Pat. Auger Bits.....	25%
C. E. Jennings & Co.:	
No. 10 ext. lip. R. Jennings' list, 25@7½	
No. 30, R. Jennings' list.....	50%
Russell Jennings.....	25@12½
L'Hommedieu Car Bits.....	15%
Mayhew's Countersink Bits.....	15%
Pugh's Black.....	20%
Pugh's Jennings' Pattern.....	35%
Snell's Auger Bits.....	60%
Snell's Bell Hangers' Bits.....	60%
Snell's Car Bits, 12-in. twist.....	60%
Snell's King Auger Bits.....	50%
Snell's Star Auger Bits.....	50@10%
Swan's.....	60@10%
Swan's, Jennings' Pattern.....	50%
Wright's Jennings' Bits.....	50%
Bit Stock Drills—	
See Drills, Tictist.	
Expansive Bits—	
Clark's Pattern, No. 1. $\frac{3}{4}$ gro. \$26; No. 2, \$18.....	60@10%
Ford's, Clark's Pattern.....	60@10@10%
C. E. Jennings & Co., Steer's Pat. 25½	
Lavigne Pat., small size, \$18.00; large size, \$28.00.....	60@10%
Swan's.....	60@10%
Climlet Bits—	Per gro.
Common Dbl. Cut.....	23.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; 11 to 15, \$5.75	
Hollow Augers—	
Bonney Pat., per doz. \$3.50@6.00	
Amer. Universal.....	20@10%
Ship Augers and Bits—	
Ship Augers.....	40@10@7½
Borl's.....	33½@5½
C. E. Jennings & Co.:	
L'Hommedieu's.....	8%
Watrous'.....	33½@7½
Snell's.....	45%
Awl Haws—See Handles, Mechanic's Tool.	
Awls—	
Brad Awls:	
Handled.....	gro. 22.75@3.00
Unhandled, Shidered,..	gro. 65@10@6½
Unhandled, Patent.....	gro. 60@2.70
Pig Awls:	
Unhandled, Patent,..	gro. 31@2½
Unhandled, Shidered,..	gro. 63@2.70
Scratch Awls:	
Handled, Com.	gro. 8.50@1.00
Handled, Socked, gro. 51.50@12.00	
Elmoro Tool Mfg. Co.:	
Tinners' and Brad Awls.....	55@15%
Scratch Awls.....	60%
Awl and Tool Sets—See Sets, Awl and Tool.	
Axes—	
Single Bit, base weights: Per doz.	
First Quality.....	\$1.75@5.00
Second Quality.....	\$1.25@4.50
Double Bit, base weights:	
First Quality.....	\$7.00@7.50
Second Quality.....	\$6.50@6.75
Axle Grease—	
See Grease, Axle.	
Axes—	Iron or Steel.
Concord, Loose Collar.....	4½@4½
Concord, Solid Collar.....	3½@3½
No. 1 Common, Loose.....	3½@4½
No. 1½ Com., New Style.....	4½@4½
No. 2 Solid Collar.....	4½@4½
Half Patent:	
Nos. 7, 8, 11 and 12.....	70%
Nos. 13 to 14.....	70%
Nos. 15 to 18.....	70@10@70@10@10½
Nos. 19 to 22.....	70@10@70@10@10½
Boxes, Axles—	
Common and Concord, not turned.....	lb. 9½@10½
Common and Concord, turned, lb. 6½@7½	
Half Patent.....	lb. 9½@10½
Bait—	
Hendryx:	
A Bait.....	20%
B Bait.....	25%
Competitor Bait.....	30@5%
Balances—	Sash
Caldwell new list.....	50@10%
Pullman.....	50@10%
Spring—	
Light Spring Balances, 60@6@6½	
Chatillon's:	
Light Spg. Balances.....	50@50@10%
Straight Balances.....	40@40@10%
Circular Balances.....	50@10%
Large Dial.....	30%
Barb Wire—See Wire, Barb.	
Bars—	Crow—
Steel Crowbars, 10 to 40 lb. per lb. 2½@2½@4	
Towel—	
No. 10 Ideal, Nickel Plate, $\frac{3}{4}$ gro. \$8.50	
Beams, Scale—	
Scale Beams.....	40%
Chatillon's No. 1.....	30%
Chatillon's No. 2.....	40%
Boaters, Carpet—	
Holt-Lyon Co.:	
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.20;	
Tinned.....	\$0.15;
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.15;	
Tinned.....	\$1.20;
No. 10 Wire Tinned.....	$\frac{1}{2}$ doz. \$1.50
Beaters Egg—	
Dover Stamping & Mfg. Co.:	
Genuine Dover, per gro. No. 1, Tumbler Size, \$1.50; No. 2, Family Size, \$1.50; No. 3, Extra Family Size, \$2.00; No. 4, Hotel Size, \$3.00.	
Holt-Lyon Co.:	
Holt, per doz. No. 5, Jap'd. \$0.20;	
No. A, Jap'd. \$1.15; No. B, Jap'd. \$1.15;	
No. 6, Jap'd. \$1.65;	
Lyon, Jap'd., per doz. No. 2, \$1.25.	
Taplin Mfg. Co.:	
Improved Dover, per gro. No. 60. \$0.40; No. 75. \$0.45; No. 100. \$0.70;	
No. 102. Tin'd. \$0.50; No. 150. Hotel, \$1.50; No. 122. Hotel Tin'd. \$1.70; No. 200. Tumbler, \$0.50; No. 202. Tumbler Tin'd. \$0.50; No. 300. Mammoth, per doz. \$25.00.	
Belows—	
Blacksmith, Standard List:	
Split Leather.....	60@10@6½
Grain Leather.....	50@10@10½
Hand—	
Inch. 6 7 8 9 10	
Doz. \$2.50 5.30 6.00 6.50 7.50	
Molders—	
Inch. 10 12 13 15 16	
Doz. \$7.50 9.00 12.00 15.00	
Bells—	Cow—
Wrought Cow Bells.....	75%
Tinny.....	15@10%
Texas Star.....	50%
Door—	
Home, R. & E. Mfg. Co.'s.....	55@15%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list: 1200, 15%; 200, 300, 900, 30%
Hendryx Bronze: Series 700, 800, 30%
Hendryx Enamelled.....35%

Calipers—See Compasses.**Calks, Toe and Heel—**

Blunt, 1 prong, per 100 lb., \$3.50@ \$3.85
Sharp, 1 prong, per 100 lb., \$1.00@ \$1.35

Burke's, 1 pg. Blunt Toe, 34¢; 2 pg. Blunt Toe, 4¢; 1 pg. Sharp Toe, 4¢; 2 pg. Sharp, 14¢; Blunt Heel, 4¢; Sharp Heel.....14¢
Lauther, Blunt, 4¢@4¢; Sharp, 4¢@4¢
Perkins, Blunt, 4¢; Sharp, 4.15¢.

Can Openers—*See Openers, Can.***Caps, Percussion—**

Eley's E. B.....52@55¢
G. D.....per M. 34@35¢
F. L.....per M. 40@42¢
G. E.....per M. 48@50¢
Musket.....per M. 62@64¢

Primers—

Berdan Primers, \$2 per M. 20¢@25%
Primer Shells and Bullets, 15¢@10%
All other primers, per M. \$1.50@1.60

Carpet Stretchers—*See Stretchers, Carpet.***Cartridges—**

Blank Cartridges:
32 C. F. \$5.50.....10@55¢
38 C. F. \$7.00.....10@55¢
22 cal. Rim, \$1.50.....10@55¢
32 cal. Rim, \$2.75.....10@55¢
B. B. Caps, Con. Ball, Siedg. \$1.90
B. B. Caps, Round Ball.....\$1.90
Central Fire.....25¢
Target and Sporting Rifle, 15¢@25%
Primed Shells and Bullets, 15¢@10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15@5%
Casters—

Bed.....65@10@70%
Plate.....60@60@65%
Philadelphia.....70@10@75%
Acme, Ball Bearing.....35¢
Gem (Roller Bearing), 70@10@10%
Steel Gem (Roller Bearing).....70%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list, 40@10%

Cattle Leaders—*See Leaders, Cattle.***Chain, Proof Coil—**

American Coil, Straight Link:
3-16 1/4 5-10 3/8 3/8 3/16 1/8
27.45 4.80 3.85 3.25 3.10 3.00
3/4-1 1/2 1 1/4 inch.
32.50 3.00
German Coil.....70@5%
German Pattern Coil:
6- to 1.....70@10@5%
2 and 3.....60@10@10@70%
4, 5 and 6.....50@10@50@10@5%
Halter—

Halter Chains.....80@5@60@10%
German Pattern Halter Chains,
list July 24, '97.....70@5%
Covert Mfg. Co.:

Halter.....35@5%
Cow Ties—

*See Halters and Ties.***Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.
6 1/2-6-3, Straight, with ring, \$26.00
6 1/2-6-2, Straight, with ring, \$27.00
6 1/2-6-2, Straight, with ring, \$30.00
6 1/2-10-2, Straight, with ring, \$35.00
NOTE.—Add 20 per pair for Hooks
Twist Traces: add per pair for Nos. 2
and 3, 2c; No. 1, 8c; No. 4, to price of
Straight Link.

Eastern Standard Traces, Wag.
on Chain, &c.....70@10@—%
Miscellaneous—

Jack Chain:
Iron.....60@10@5@60@10@10%
Brass.....65¢
Safety and Plumbers' Chain, 75%
Gal. Pump Chain.....1b, 4 1/2@7%
Bridgeport Chain Co.:
Triumph Halter and Coll. 35-32 1/2@40%
Triumph Dog.....70@10@60%
Brown Halter and Coll. 35@5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal.
lion.....40%
Oneida Community:
American Halter, Dog and Kennel
Chains.....35@2 1/2@40%
Niagara Dog Leads and Kennel
Chains.....35@5@5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl. Jointed Chain.....70%
Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Fullman:
Bronze Chain, 60%; Steel Chain,
Coppered.....60@10%
Sash Chain Attachments, per set, 5¢
Aluminoy Sash Ribbon, per 100
ft. \$2.00@35.00
Sash Ribbon Attachments, per set, 5¢

Chalk—

Carpenters' Blue.....gro. 50@55¢
Carpenters' Red.....gro. 50@55¢
Carpenters' White.....gro. 50@45¢

Checks, Door—

Bardsley's.....45¢
Fullman, per gro.....\$2.00
Russwin.....35%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55¢
Youths' Chests, with Tools.....49¢
Gentleman's Chests, with Tools, 39¢
Farmers' Carpenters, etc. Chests,
with Tools.....39¢
Machinists' and Pipe Fitters'
Chests, Empty.....45¢
Tool Cabinets.....45¢
C. E. Jennings & Co.'s Machinists
Tool Chests.....74¢

Chisels—

Socket Framing and Firmer
Standard List. 80@10@20@10@10%
Buck Bros. 30%
C. E. Jennings & Co.:
Socket Firmer No. 19, 25@1 1/2%
Socket Framing No. 19, 25@1 1/2%
Swan's.....60@270%
L. & I. J. White & Co. 25@2%

Tanged—

Tanged Firmer.....50@55@55%
Buck Bros. 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co. 25@2%
Cold—lb.

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat, each \$3.00.....35@5%
Blacksmiths.....25%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible.....35%
Empire.....25%
Jacobs' Drill Chucks.....35%
Morrow Ball Bearing Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Lathe Chucks:
Independent.....35%
Universal, Reversible Jaws.....35%
Universal, Com. Style Jaws.....40%
Combination, Reversible Jaws.....35%
Combination, Com. Style Jaws, 40%
Round Body or Box Body, 2 Chuck
Jaws.....25%
Geared Scroll Chucks.....25%
New Model, 25%; Geared Pat-
tern, 25%; Skinner Patent, 25%
Positive Drive.....40%
Planer Chucks.....25%
Standard.....45%
Drill Press Vises.....35%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17, 40%; No. 21, 35%
Scroll Combinations, Nos. 33 and
34.....30%
Geared Scroll, Nos. 33, 34 and 35, 25%
Independent Iron, Nos. 18 and 318, 35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101,
102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15, 40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and
72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%
Whitaker Mfg. Co.:
National Drill.....25%
Clamps—

Carriage Makers', Star, P. S. & W.
Co. 50%
Besly, Parallel.....33@10%
Hammer & Co.:
Adjustable.....20@5%
Carriage Makers' H. P. Screw, 40@5%
Myers' Hay Rack.....50%
Lineman's Swedish Neverturn, 65%
Saw Clamps, see Vises, Saw Fliers.

Cleaners, Drain,
Wian's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%
Side Walk—

American Fork & Hoe Co.:
Star, 3¢ doz., Socket, \$4.00;
Shank, 3¢ doz., X 7/8, \$3.50; Shank,
X 8.....\$3.75

Cleavers, Butchers—

Foster Bros. 30%
Fayette R. Plum....30%
L. & I. J. White Co. 30%

Clippers, Horse and
Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each, \$10.75

20th Century Horse, each, \$5.00
Lightning Belt Horse, each, \$15.00
Chicago Belt Horse, each, \$20.00
Stewart's Enclosed Gear Ball
Bearing Horse, each, \$7.50

Stewart's New Model Sheep
Shearing Machine, each \$12.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each, \$9.75

Clips, Axle—

Regular Styles.....80@80@10%
Cloth and Netting, wire

—See Wire, dc.

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene,

Racking, Liquor, Bottling,
do.....75%

Compression Bibbs.....70%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list.....60%
Leather, Walter B. Stevens & Son's
list.....60%

Clothes, Dog—

Bardsley's.....45%

Fullman, per gro.....\$2.00

Russwin.....35%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55¢

Youths' Chests, with Tools.....49¢

Gentleman's Chests, with Tools, 39¢

Farmers' Carpenters, etc. Chests,
with Tools.....39¢

Machinists' and Pipe Fitters'
Chests, Empty.....45¢

Tool Cabinets.....45¢

C. E. Jennings & Co.'s Machinists
Tool Chests.....74¢

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Tool Cabinets.....74¢

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Sausage Stuffers or FillersSee *Stuffers or Fillers, Sausage*.**Saw Frames**See *Frames, Saw*.**Saw Sets**—See *Sets, Saw*.**Saw Tools**—See *Tools, Saw*.**Saws**—

Atkins':	
Circular	45%
Band	50@50&10%
Butcher Saws	50%
Cross Cuts	40%
One-Man Cross Cut	40%
Narrow Cross Cut	50%
Hand, Rip and Panel	35@5%
Miter Box and Compass	40%
Mulay, Mill and Drag	45%
Wood Saws	40&10%

Chapin-Stephens Co.:

Turning Saws and Frames, 30@30&10%

Diamond Saw and Stamping Works:

Sterling Kitchen Saws—30@10&10%

Dissont's:

Circular, Solid and Ins'ted Tooth, 50%

Band, 2 to 18 in. wide, 60%

Band, 3 to 14%, 60%

Crosscuts, 45%

Narrow Crosscuts, 50%

Mulay, Mill and Drag, 40%

Framed Woodsaws, 25%

Wood saw Rods, Tinned, 15%

Hand Saws, Nos. 12, 99, 9, 16, d100

D8, 120, 76, 77, 8, 25%

Hand Saws, Nos. 7, 107, 107½, 3, 1

0, 00, Combination, 30%

Compass, Key Hole, &c., 25%

Hand Ice Saws, 45%

Butcher Saws and Blades, 30%

C. E. Jennings & Co.'s:

Bach Saws, 16%

Butcher Saws, 25@7%

Compass and Key Hole Saws, 33@7%

Framed Wood Saws, 25@7%

Hand Saws, 12%

Wood Saw Blades, 33@7%

Miller's:

Butcher Saws, 15@10%

Star Saw Blades, 15@10%

Massachusetts Saw Works:

Victor Kitchen Saws, 40@10@50%

Butcher Saws Blades, 35@40%

Peace & Richardson's Hand Saws, 30%

Simonds':

Circular Saws, 45%

Crescent Ground Cross Cut Saws, 30%

One-Man Cross Cuts, 40@10%

Gang Mill, Mulay and Drag Saws, 45%

Band Saws, 50%

Back Saws, 25@25@7%

Butcher Saws, 35@35@7%

Hand Saws, 25@25@7%

Hand Saws, Bay State Brand, 45%

Compass, Key Hole, &c., 25@25@7%

Wood Saws, 40@74%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws, 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A, 25%

Dissont's:

Concave Blades, 25%

Chromol Blades, 30%

Hack Saw Frames, 30%

Simonds, 25%; The Best, 35%

C. E. Jennings & Co.'s:

Hack Saw Frames, Nos. 175, 180, 40@7%

Hack Saws, Nos. 175, 180, complete, 40@7%

Goodell's Hack Saw Blades, 40@10%

Griffin's Hack Saw Frames, 35@5@10%

Star Hack Saws and Blades, 15@10%

Sterling Hack Saw Blades, 30@10@5%

Sterling Hack Saw Frames, 30@10@10%

Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00, 10%

Victor Hack Saw Blades, 20%

Victor Hack Saw Frames, 40%

Whitaker Mfg. Co.:

National Hand Blades, Hand

Frames, Power Blades, 40%

Scroll—

Barnes, No. 1, \$15, 25%

Barnes Scroll Saw Blades, 40%

Barnes' Velocipede Power Scroll Saw, without boring attachment, \$15,

with boring attachment, \$20, 20%

Lester, complete, \$10.00, 15@10%

Rogers, complete, \$3.50 and \$4.00, 15@10%

Scales—

Union Platform, Plain, \$2.10@2.20

Union Platform, Stpd, \$2.20@2.30

Chatillon's:

Eureka, 25%

Favorite, 40%

Grocers' Trip Scales, 50%

The Standard Portables, 40%

The Standard R. R. and Wag-

Scrapers—

Box, 1 Handie, \$1.85@2.10

Box, 2 Handie, \$2.35@2.50

Ship., Light, \$2.00; Heavy, \$4.50

Chapin-Stephens Co., Box, 30@30@10%

Richards Mfg. Co., Foot, 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50@

2.75, 1½, \$3.00@3.25, 1½,

3.50@3.75

Bench, Wood, 70@10@70@10@10%

Hand, Wood, 70@10@70@10@10%

Chapin-Stephens Co., Hand, 70@70@10@2%

Coach, Lag and Hand Rail—

Lag, Cone Point, \$0.60@

Coach, Gimlet Point, \$0.65@

Hand Rail, 70@10@75%

Jack Screws—

Standard List, 70@10@75%

Millers Falls, 50@10@10%

Swett Iron Works, 70@75%

Machine—**Cut Tread, Iron, Brass or Bronze:****Flat Head or Round Head,** 50@50@10%**Fillister Head**, 40@40@10%**Rolled Thread, F. H. or R. H., Iron**, 75@10%**F. H. or R. H., Brass, Nos. 8 to 14**, 65@10%**Set and Cap—****Set (Iron)**, 75@10@75@10%**Set (Steel), net advance over Iron**, 25%**Sq. Hd. Cap**, 70@10@75@10%**Hex. Hd. Cap**, 70@10@75@10%**Rd. Hd. Cap**, 50@75@10%**Fillister Hd. Cap**, 60@75@10%**Wood—****List July 23, 1903.****Flat Head, Iron**, 37@45@10%**Round Head, Iron**, 35@45@10%**Flat Head, Brass**, 50@50@10%**Round Head, Brass**, 77@45@10%**Flat Head, Bronze**, 75@5@10%**Round Head, Bronze**, 78@45@10%**Drive Screws**, 87@45@10%**Scroll Saws—**See *Saws, Scroll*.**Scythes**—**Per doz.****Plain Grass, Cutting Edge Polished**, 36.25@36.50**Clipper, Bronzed Web**, 36.50@36.75**Solid Steel, Web and Backs Polished**, 37.00@37.25**Bush, Weed and Bramble, Painted**, 36.50@36.75**Grain, Painted, Cutting Edge Polished**, 38.25@38.50**Clipper Grain, Bronze Web**, 38.50@38.75**Seeders, Raisin—****Enterprise**, 25@30%**Sets— Awl and Tool****Fray's Tool Handles, Nos. 1, \$12, 2, \$16; 3, \$12**, 50%**Millers Falls Adj. Tool Handles, No. 1, \$12; No. 2, \$12; No. 5, \$18, 20@10%****Garden Tool Sets—****American Fork & Hoe Co.****Rake, Shovel and Hoe, 4 lb. sets, No. 3 P F****Sets, Nail—****Octagon**, 3 gro. \$3.50@3.70**Buck Bros.**, 27@27**Elmore Tool Mfg. Co.**, 30@30**Mayhew's**, 30@30**Snell's Corrugated, Cup Pt.**, 40@10@10%**Snell's Knurled, Cup Pt.**, 40@10@10%**Victor Knurled, Cup Pt.**, 37.50**Rivet—****Regular Nat.**, 75@75@10%**Saw—****Atkins':****Criterion**, 40%**Adjustable**, 40%**Dissont's Star, Monarch and Triumph**, 30%**Giant Royal Cross Cut**, \$9.00**Morrill's No. 1**, \$15.00**Nos. 3 and 4, Cross Cut**, \$20.00**No. 5, Mill**, \$30.00**No. 10, 11, 12, 13**, \$15.00**No. 1 Old Style**, \$10.00**Royal, Hand**, \$9.00**Seymour Smith & Son's**, \$1.50**Taintor Positive**, \$9.00**Shaving—****Fox Shaving Sets, No. 30****Smith & Hemenway Co.**, 75%**Sharpener, Knife—****Pike Mfg. Co.****Fist Cut Pocket Knife Hones**, \$1.50**Mounted Kitchen Sand Stone**, \$1.50**Natural Grit Carving Knife Hones**, \$1.50**Hones, \$1.50****Quick Cut Emery Carving Knife Hones**, \$1.50**Knife Hones, \$1.50****Quick Edge Pocket Knife Hones**, \$1.50**Knife Hones, \$1.50****Skate—****Smith & Hemenway Co., Eureka, 50%****Shaves, Spoke—****Iron**, \$1.25**Wood**, \$1.20**Chapin-Stephens Co.**, 30@30@10%**Goodell's**, \$9.00**Seymour Smith & Son's**, \$1.50**Shears—****Cast Iron**, \$1.25**Wood**, \$1.20**Chapin-Stephens Co.**, 30@30@10%**Goodell's**, \$9.00**Seymour Smith & Son's**, \$1.50**Straight Trimmers, &c.****Best Quality Jap.**, 70@10@5%**Best Quality Nickel**, 50@10@5%**Tailor's Shears**, 40@40@10%**Acme Cast Shears**, 40@40@5%**Columbian Cutlery Co.**, 30@10@5%**Sheep, 1500 list**, 30@10@5%**Grass**, 50@10@5%**Horse or Mule**, 50@10@5%**W. H. Compton Shear Co.**, 30@10@5%**Japan Handles, Nickel Blad.****Full Nickel**, 60@10@5%**Heinrich's Tailor's Shears**, 10%**National Cutlery Co.'s Nickel Plated**, 60@10@5%**Japan Handles**, 70@10@5%**J. Wiss & Sons Co.****Best Quality Jap'd.**, 50@10@5%**Best Quality Nickel'd.**, 50@10@5%**Tailor's**, 25%**Tinners' Snips—****Steel Blades**, 20@20@10@10%**Steel Laid Blades**, 50@50@10@10%**Acme Cast Snips**, 40@40@5@5%**W. H. Compton Shear Co., Forged Steel Handles**, 35%**Forged Handles, Steel Blades, Bar-****Heinrich's Snips**, 50@50@10@10%**Jennings & Grinn Mfg. Co.**, 30@10@5@5%**National Cutlery Co.'s Forged Steel**, 50@50@10@10%**Niagara Snips**, 50@50@10@10%**P. W. R. W.**, 50@50@10@10%**J. Wiss & Sons Co**

Scythe Stones—

Pike Mfg. Co.	1807 list.
Black Diamond S. S.	3 gro. \$12.00
Lamotte S. S.	3 gro. \$11.50
White Mountain S. S.	3 gro. \$10.50
Green Mountain S. S.	3 gro. \$10.00
Extra Indian Pond S. S.	3 gro. \$10.00
No. 1 Indian Pond S. S.	3 gro. \$10.00
No. 2 Indian Pond S. S.	3 gro. \$10.00
Leader Red End S. S.	3 gro. \$10.00
Quick Cut Emery	3 gro. \$10.00
Pure Corundum	3 gro. \$10.00
Crescent	7.00
Emery Scythe Rifes	2 Coat. \$16.00
Emery Scythe Rifes	3 Coat. \$11.00
Emery Scythe Rifes	4 Coat. \$13.00
Balance of 1907 list	35%
Lectro (Artificial)	3 gro. \$12.00 35%
\$12.00	33%
Lightning (Artificial)	3 gro. \$10.00
\$18.00	35%

Stoppers, Bottles—

Victor Bottle Stoppers	3 gro. \$1.00
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Stops—Bench—

Millers Falls	15@10%
Morrill's, 3 doz. No. 1	\$10.00 50%
Morrill's, No. 2	\$12.50 50%

Seymour Smith & Son's	50%
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Door—

Chapin-Stephens Co.	50@50@10%
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Plane—

Chapin-Stevens Co.	20%
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Straps—Box—

Acme Embossed, case lots	20@10@10%
Cary's Universal, case lots	20@10@10%

Stretchers, Carpet—

Cast Iron, Steel Points	dos. 55¢
All Steel Socket	dos. \$2.00 @ \$2.25

Excelsior Stretcher and Tack Hammer Combined	3 gro. \$6.00 20%
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Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses	25@50@75%
National Specialty Co., list Jan. 1, 1902	30@50%

Sweepers, Carpet—

Goshen Sweeper Co.	Per doz.
Gilt Edge	\$2.00
Superfine	24.00
Majestic	24.00
Select, Nickeled	22.00

National Sweeper Co.	
National Queen, Nickeled	\$27.00
Martha Washington, Nickeled	25.00
Monarch, Japanned	20.00
Perpetual, Japanned	18.00

Streator Metal Stamping Co.	
Model E. Sanitaire	\$2.00
Eureka	15.00
Streator Majestic, Nickeled	24.00
Streator Conqueror, Japanned	22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: \$1 per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks	90@25@%
American Cut Tacks	90@25@%
Screws' Cut Tacks	1. 90@30@%
Screws' Upholsterers	90@35@%
Gimp Tacks	90@35@%
Lace Tacks	90@35@%
Trimmers' Tacks	90@30@%
Looking Glass Tacks	65@10@%
Bill Posters' and Railroad Tacks	90@10@%
Hungarian Nails	80@10@%
Finishing Nails	70@10@%
Trunk and Clout Nails	75@10@%

NOTE.—The above prices are for straight weights.

Miscellaneous—

Double Pointed Tacks	90@6 tens@%
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See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.	
Gasoline	Oil
\$1.75	\$1.00
\$3.50	\$1.00
\$1.00	\$1.75

Tapes, Measuring—

American Asses' Skin	50@—%
Patent Leather	25@50@5%
Steel	33@45@%

Chesterman's	25@50@5%
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Keuffel & Esser Co.	
Favorite, Ass Skin	10@10@50%
Favorite, Duck and Leather	25@50@10%
Metallic and Steel, lower list	35@5%
Luking:	
Asses' Skin	10@10@50%
Metallic	30@30@5%
Patent Bend, Leather	25@50@5%
Pocket	40@40@5%
Steel	33@33@5%

Webb & Bilger:	
Chesterman's Metallic	No. 311, etc.
Chesterman's Steel	No. 1038L, etc.
etc.	35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/4-inch and larger	per 100 lb.
	\$2.55 @ \$2.80

Thermometers—

Tip Case Cabinet, Flange, Dairy, &c.	30@35%
Ties, Bale—Steel Wire	Single Loop 25@10%
Monitor, Cross Head, &c.	70@45@2%

Tinners' Shears, &c.—

Tinners' Shears, &c.	See Shears, Tinners', &c.
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Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.	
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Tire Benders, Upsetters, &c.**Tools—Coopers'**

L. & I. J. White	20@30@5%
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Haying—

Myers' Hay Tools	50%
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Ice Tools—

Gifford-Wood Co.	15%
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Miniature—

Smith & Hemway Co., David-son, 3 doz. Nickel Plated	\$1.50
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Gold Plated	\$2.00
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Saw—

Atkins' Cross Cut Saw Tools	35@5%
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Simond's Improved	35@5%
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Simond's Crescent	30%
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Ship—

L. & I. J. White	25%
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Torches—

Hammers, Engine, 3 doz.	\$1.50
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Transom Lifters—

See Lifters, Transom.	
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Traps—Fly—

Balloon, Globe or Acme, doz.	\$1.15@1.25
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Harper, Champion or Paragon, doz.	\$1.25@1.40
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Game—

Imitation Oneida	75@10%
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Newhouse	50@5%
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Hawley & Norton	65@10%
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Victor	75@10@10%
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Oneida Community Jump	70@5%
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Stop Thief	60@5%
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Tre Trap	60@5%
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